

In the matter of Proposed Part 212 Amendments
Technical Support Document ("TSD")
R95-

Illinois Environmental Protection Agency
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PROPOSED PART 212 AMENDMENTS TECHNICAL SUPPORT

Introduction

On November 15, 1990, the Granite City, Lake Calumet, and McCook, Illinois areas were classified by operation of law as particulate matter nonattainment areas. Pursuant to Section 189 of the Clean Air Act, on May 15, 1992, Illinois submitted the required State Implementation Plan (SIP) revision for these areas. On November 18, 1994 the United States Environmental Protection Agency (USEPA) conditionally approved the Illinois State Implementation Plan (SIP) for attaining and maintaining the National Ambient Air Quality Standards (NAAQS) for particulate matter with a nominal aerodynamic diameter equal to ten micrometers or less (PM-10) [59 FR 59653 (Ex. 1)]. This conditional approval concerns the PM-10 SIP for the nonattainment areas of Granite City, Lake Calumet, and McCook, Illinois. These areas are described at 35 Ill. Adm. Code 212.324(a)(1).

In conditionally approving the Illinois PM-10 SIP the USEPA requested that Illinois address the following items: 1) allowable emissions from the basic oxygen furnaces (BOFs) shop at Granite City Steel; 2) an opacity limit for coke oven combustion stacks; and 3) an enforceable emission limit for electric arc furnaces in Granite City. This Technical Support Document (TSD) provides technical support for the Agency's proposed regulatory changes addressing USEPA's concerns. This TSD also provides background for several minor amendments in the proposal including a clarification in the definition of opacity and adjusting the rules for magnesium pot furnaces.

Background

PM-10 is in the size range which is most damaging to human health because of the tendency for such small particles to become trapped in the lungs' air passages rather than be readily exhaled (52 FR 24660, Ref. 6, Att. 14(b)). PM-10 emissions are produced by a number of human activities, including: fuel combustion, industrial operations, materials handling; and vehicular traffic. PM-10 is emitted from stacks or from unenclosed or uncovered areas such as unpaved roadways where traffic creates dust. PM-10 particles that are not emitted from stacks are called "fugitive" emissions. PM-10 which is gaseous at the point of emission but which condenses into liquid or solid particles in the ambient air is known as "condensible PM-10."

The USEPA has established NAAQS for PM-10: an annual arithmetic mean, i.e., an annual "average", concentration of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); and a maximum 24-hour concentration of 150 $\mu\text{g}/\text{m}^3$ not to be exceeded more than once per year. (40 CFR 50, Ref. 6 (Att. 14(c))) The PM-10 NAAQS have also been adopted by the Illinois Pollution Control Board (Board) as Illinois Standards in 35 Ill. Adm. Code 243.120.

Discussion

Basic Oxygen Furnaces: Section 212.446(c)

BOFs are large pear-shaped refractory lined vessels in which a mixture of molten iron from blast furnaces and scrap are converted to steel by lancing or injecting oxygen. The oxygen burns off the excess carbon found as an impurity in the charge, thus converting the molten metal to steel. BOFs are used at Granite City Steel in Granite City, Illinois. 35 Ill. Adm. Code 212.446(a) requires that particulate matter emissions, which includes PM-10 emissions, from BOFs be collected and ducted to control equipment. This equipment that capture emission of particulate matter consists of hoods placed over the furnaces, and then the emissions are ducted to a stack having control equipment. Although the hoods capture a very high percentage of the furnaces' particulate emissions, they do not capture all such emissions because there is air space between the BOF and the hoods and in the hood opening through which the oxygen lance passes. Those emissions that are not captured cannot be readily quantified by direct measurements in terms of the mass of emissions as can be done with captured (stack) emissions. An opacity limit is therefore used instead of a mass emission limit for uncaptured particulate emissions, e.g. as in 40 CFR 60.142a(a)(1) (Ref. 7 (Att. 14(d))). This Section specifies an opacity limit for roof monitors and other building openings in certain BOF shops. Opacity roughly corresponds to the mass of the emissions for a given emission unit, i.e., the greater the opacity, the greater the amount of uncaptured particulate (including uncaptured PM-10) emissions released. The current opacity limit for BOFs is 35 Ill. Adm. Code 212.123, which generally restricts maximum opacity to 30 percent.

USEPA believes that the PM-10 emissions from the Granite City Steel BOF roof monitor were underestimated in Illinois' SIP submittal, i.e., that the emissions that correspond to a 30% opacity limitation are greater than those included in the SIP submittal Ex. 1). A lower opacity limit would correspond more accurately to the emissions used in the SIP submittal. The Agency therefore proposes to include a 20% opacity limitation, with a 3-minute average, for uncaptured particulate matter emissions from the BOF shop at Granite City Steel (see 35 Ill. Adm. Code 212.446(c)). A three

minute average addresses the fact that portions of the BOF steel making cycle that can exhibit high opacity, e.g., hot metal transfer, do not last for the full six minutes employed in a standard Method 9 reading. A numerical limit of 20% was selected as appropriate because the nearby states of Michigan, Indiana, and Ohio have all adopted a 20% opacity limit for BOF uncaptured particulate emissions. (Ex. 3) Compliance in all three states is determined using 3-minute averages. The Michigan, Indiana, and Ohio opacity limits have all been approved by USEPA.

Granite City Steel has agreed to this lower opacity limit in a proposed construction permit for an increase in iron and steel production from the plant. Recent improvements in its emissions control system for the BOF allow Granite City Steel to accept this new limit. The adoption of a 20% three-minute average opacity limit provides acceptable limitation of the uncaptured BOF emissions

It is also necessary to take a further look at captured BOF emissions. With uncaptured BOF charging, refining, and tapping emissions restricted by an opacity limit, the mass limit of 68.5 pounds of PM-10 per hour in Section 212.458(b)(23) was only intended to apply to captured charging, tapping, and refining emissions from the BOF, as measurable at the control system stack. This intent is being clarified. Further as part of its proposed construction permit, given the improvements to the BOF control system Granite City Steel has agreed to a more stringent limit of 60 pounds of PM-10 per hour, and a rate-based limit of 0.225 pound of PM-10 per ton of steel produced. As the Agency has determined that the limits of 60 pounds of PM-10 per hour or 0.225 pounds of PM-10 per ton of steel produced represent reasonably available control technology for captured BOF charging, refining, and tapping emissions, the Agency has proposed to include these new limits in 35 Ill. Adm. Code 212.458(b)(23).

Since both the uncaptured emissions and captured emissions of the BOF at Granite City Steel are now appropriately restricted, the Agency believes that these new requirements should replace current provisions in 35 Ill. Adm. Code 212.446(a), which refer back to 35 Ill. Adm. Code 212.321 and 212.322.

Coke Oven Combustion Stacks: Section 212.443(g) 30% Opacity Limitation

Coke ovens convert coal to coke by heating the ovens using a network of flues surrounding the individual ovens. The flues are connected to a common stack called the combustion stack. Currently coke oven combustion stacks have a particulate matter mass emission limit of 0.05 gr/dsf (35 Ill. Adm. Code 212.443(g)), but do not have opacity limit. Opacity limits routinely apply to emission units with stacks have mass emissions limits, in order to expediently determine if the mass emission limit is being met.

Currently there are coke ovens at Acme and LTV Steel in the Lake Calumet area and Granite City Steel in Granite City. Based on observations of the Agency's Field Operations Section (FOS), the coke oven stacks will meet the proposed 30% limit if the flues are properly maintained (Ref. 8). However, as the ovens in a coke battery age, wear in the walls can allow leakage of coke oven emissions into the heating/exhaust gas flues (Exhibit 2). Such leakage is not only detrimental to the coking process but it also causes an increase in PM-10 emissions, and, therefore an increase in opacity. The opacity increase is not ordinarily of sufficient magnitude to cause a violation of the proposed 30% opacity limitation, but if the leak is not repaired in sufficient time, mass PM-10 emissions and opacity will increase greatly, as well as, a worsening of coking efficiency. (Ex. 2 and Ref. 8).

Repair of such leaks, however, entails taking an affected coke oven out of production or off-line to allow workers to repair the leak by ceramic welding. While the oven is off-line, a fuel-rich mixture is burned in the surrounding flues which generates little heat but much smoke to show the ceramic welders the location of the leaks. Most of this smoke escapes to the combustion stack so combustion stack emissions with opacities greater than 30% may exist until the leak is repaired and the oven is brought back on line. (*Id.*, p.2)

In order to prevent increasing opacities and emissions of PM-10 from occurring for the remaining lifetime of the oven after leaks into the flue work develop, higher opacities than 30% must be permitted for a time period ranging from one to three hours during the repairs. Therefore, the Agency proposes that the 30% coke oven stack opacity limit not apply when one or more ovens are off-line for leak repair, but that the non-applicability of the opacity limit be limited to three hours per oven repaired.

Granite City Electric Arc Furnace: Section 212.458(b) (16)

Currently 35 Ill. Adm. Code Section 212.458(b) imposes a mass PM-10 emission limit of 0.01 gr/scf on electric arc shop roof ventilators at the American Steel Foundry plant in Granite City, Illinois. Although the 0.01 gr/scf limit had been found adequate to represent reasonably available control technology, this grain loading limit is not adequately enforceable because of the nature of the ventilators. The ventilators are too short to accommodate stack test apparatus and can not be easily altered to do so on either a permanent or temporary basis. Hence it is not possible to readily test whether the emissions from the ventilators, are in compliance with the mass emission limit of 0.01 gr/scf. (Ex. 1)

The Agency has discussed this issue extensively with the American Steel Foundry and USEPA. USEPA has agreed that if the roof ventilators do not exhibit more than 20% opacity, that would be

equivalent to having a PM-10 mass emission limit of 0.01 gr/scf (Ref. 7). Further, a 20% opacity limit is being applied to the entire foundry because several other stacks may also be too short for testing. The fugitive emission units at the foundry are already subject to a 20% opacity limit (See 35 Ill. Adm. Code 212.316).

Clarification of the definition of "Opacity"

On April 13, 1972, Illinois adopted Sections 212.122 and 212.123 in which opacity percentage rather than the Ringelmann chart is the primary criterion for assessing visible particulate matter emissions (PCB R71-23). Historically, the Agency has used the observation methods contained in (40 CFR Part 60, Appendix A) Method 9 to determine compliance with Sections 212.122 and 212.123, but has not used the data reduction procedure of that method. Method 9 specifies that an average of opacity readings taken at 15 second intervals shall be employed to determine compliance with an opacity standard. Section 212.109 (measurement methods for opacity) which incorporates Method 9 became effective May 11, 1992. Since Method 9 is the method used to read opacity, the Agency now proposes to amend the definition of opacity and to delete references to the Ringelmann chart.

Secondary Aluminum Smelting and Refining Plant in Granite City : Section 218.458(b)(25)

The secondary aluminum smelting and refining plant in the vicinity of Granite City, Illinois, Spectrulite Consortium Inc., processes aluminum and magnesium for various products. This plant has three magnesium furnace pot lines which furnaces are vessels in which magnesium scrap is refined in the absence of oxygen so as to render it suitable for making various products. However, the company is limited under current regulations to operating one line at any time. (35 Ill. Adm. Code 212.458(b)(25))

The Agency has reviewed an updated emissions inventory and concluded that the air quality impact of this source had been overestimated primarily because of incorrect stack parameters but also because a number of emission units in the original inventory have been shut down. The company has requested that regulations be amended to allow it to operate two magnesium furnace pot lines at the same time. In fact, the Agency has determined that operation of two magnesium pot furnace lines at the same time does not represent an increase in modeled PM-10 impact from this source. Therefore, the Agency believes that this revision is appropriate.

Environmental Impact

There is a beneficial environmental impact for the lowering of the opacity limit for basic oxygen furnace uncaptured emissions at Granite City Steel and the imposing of an opacity limit on combustion stacks at coke plants. Although these emission units now comply with the Agency's proposed opacity limitations, these changes will make these requirements permanent. There will also be an environmental benefit for the change from a gr/scf limit to an opacity limit for the roof ventilators at the American Steel Foundry. Even though the two limits require equivalent emissions control, the new limit is enforceable. Finally, there is no significant adverse environmental impact from allowing two magnesium pot lines to operate simultaneously at Spectrulite Consortium because, as stated above, the inventory submitted with the SIP submittal has been updated. Finally, there is a beneficial environmental impact from redefining the term "opacity" without reference to the Ringelmann chart to reflect the methods used by the Agency to read opacity.

Economic Impact

For the BOF uncaptured PM-10 emission standard, for the coke oven combustion opacity limit, and for the steel foundry electric arc furnace opacity limit there will be no capital cost to the owners of such emission units since the affected units presently can comply with the proposed limitations. The operating costs associated with the proposed limitations are not believed to be significant, especially as Granite City Steel is pursuing a construction permit for a production increase which would require compliance with the proposed limitation by the BOF.

The proposal affecting the secondary aluminum smelting and refining plant discussed above, however, is of positive value to the owners of the plant. In the company's testimony at hearing for variance from the 35 Ill. Adm. 212.458(b)(25) one pot furnace at a time limitation, the company asserted that the variance would gain the company \$15,000,000 per year in increased revenue (Ex. 4).

Conclusion

The Agency's inventory revisions noted previously, and the Board's adoption of the foregoing regulatory changes, including several revisions which are part of the Agency's clean-up language, should satisfy the conditions of USEPA's conditional approval of the Illinois PM-10 SIP.

Proposed Part 212 Amendments

References

1. USEPA's Conditional Approval (59 FR 59653-56 (Nov. 18, 1994) (Ex. 1)
2. September 29, 1995 letter from Robert Sistek to Dennis Lawler (Ex. 3)
3. Michigan, Indiana, and Ohio BOF Opacity Limits (Ex. 2)
4. Spectrulite Consortium Variance Transcript (PCB 96-6, p. 16) (Ex. 4)
5. 52 FR 24660 (July 1, 1987) (Att. 14(b))
6. 40 CFR 50.6 (Att. 14 (c))
7. 40 CFR 60.142a(a)(1) (Att. 14(d))
8. Conversations with FOS Personnel
9. August 24, 1995 meeting between various Agency and steel industry personnel and counsel
10. Agreements with American Steel Foundry

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Records and Archives Center on November 17, 1993.

(ii) Additional material.

(A) The document entitled "Hidalgo Smelter Sulfur Recovery Procedures," including appendix 1, "Physical Inventory for Sulfur Recovery Calculations," and appendix 2, "Monthly Sulfur Recovery Calculation."

(FR Doc. 94-28485 Filed 11-17-94; 3:45 am)

BILLING CODE 5560-50-F

40 CFR Part 52

[125-2-6544; FRL 5097-4]

Approval and Promulgation of Implementation Plans; Illinois

AGENCY: United States Environmental Protection Agency (USEPA).

ACTION: Final rule.

SUMMARY: On May 25, 1994, the USEPA proposed to conditionally approve a State Implementation Plan (SIP) request for Lake Calumet, McCook, and Granite City, Illinois. The request was submitted by the State of Illinois for the purpose of bringing about the attainment of the National Ambient Air Quality Standards (NAAQS) for particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM). Public comments were solicited on the proposed SIP revision, and on USEPA's proposed rulemaking action. The public comment period ended on June 24, 1994, and two public comment letters were received. This rulemaking action conditionally approves, in final, the SIP revision request for Lake Calumet, McCook, and Granite City, Illinois as requested by Illinois.

EFFECTIVE DATE: This final rule becomes effective on December 19, 1994.

ADDRESSES: Copies of the State's submittal, and other materials relating to this rulemaking are available at the following address for review: United States Environmental Protection Agency, Region 5, Air and Radiation Division, 77 West Jackson Boulevard, Chicago, Illinois 60604.

The docket may be inspected between the hours of 8:30 a.m. and 12 noon and from 1:30 p.m. until 3:30 p.m. Monday through Friday. A reasonable fee may be charged by the USEPA for copying docket material.

A copy of this SIP revision is available for inspection at: Office of Air and Radiation (OAR), Docket and Information Center (Air Docket 6102), room 1500, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460.

FOR FURTHER INFORMATION CONTACT: David Pohlman, Regulation

Development Branch, Regulation Development Section (AR-18f), U.S. Environmental Protection Agency, Region 5, Chicago, Illinois 60604, (312) 886-3299.

Anyone wishing to visit the Region 5 offices should first contact David Pohlman.

SUPPLEMENTARY INFORMATION:

Background

Under section 107(d)(4)(B) of the Clean Air Act (Act), as amended on November 15, 1990 (amended Act), certain areas ("initial areas") were designated nonattainment for PM. Under section 188 of the amended Act these initial areas were classified as "moderate". The initial areas include the Lake Calumet, McCook, and Granite City, Illinois, nonattainment areas. (See 40 CFR 81.314 for a complete description of these areas.) Section 189 of the amended Act required State submission of a PM SIP for the initial areas by November 15, 1991.

Illinois submitted the required SIP revision for the Lake Calumet, McCook, and Granite City, Illinois, PM nonattainment areas to USEPA on May 15, 1992. The submitted control measures for point sources in the Lake Calumet, McCook, and Granite City nonattainment areas include a general grain loading limit of 0.03 grains per standard cubic foot (gr/scf), as well as control measures for specific sources. The specific control measures consist of regulations that impose grain loading limits, pounds per ton limits, and pounds per million British thermal units limits (lb/MMBTU). Other control measures for specific sources are listed in sections 212.324, 212.362, 212.425, 212.458, and 212.464 of Title 35: Environmental Protection; Subtitle B: Air Pollution; Chapter 1: Pollution Control Board, of the Illinois Administrative Code (35 IAC). The new regulations impose tighter and more enforceable limits than the current SIP approved rules.

Upon review of Illinois' submittal, USEPA identified several concerns. Illinois submitted a letter on March 2, 1994, committing to satisfy all of these concerns within one year of final conditional approval. The concerns are as follows:

1. The USEPA believes that Illinois has underestimated emissions from the roof monitors for the Basic Oxygen Furnaces (BOFs) at Granite City Steel (GCS) and Acme Steel; the quench towers at GCS, Acme Steel, and LTV Steel; the rotary kiln incinerator at CWM Chemical Services; 3 coal fired boilers at CPC International; and, 3 coal

fired boilers at GM Electromotive Division.

2. Because of the length of time it may take to determine whether an area has attained the standards, USEPA recommends that PM nonattainment area SIP submittals demonstrate maintenance of the PM NAAQS for at least 3 years beyond the applicable attainment date. (See an August 20, 1991, memorandum from Fred H. Renner, Jr. to Regional Air Branch Chiefs titled "Questions and Answers for Particulate Matter, Sulfur Dioxide, and Lead.") While Illinois' submittal did take growth into account in the modeling analysis, it did not adequately address maintenance of the NAAQS for PM in the nonattainment areas.

3. On December 29, 1992, USEPA approved general opacity limitations for the State of Illinois. See 57 FR 61834. These opacity limitations are found at subpart B under 35 IAC 212. Subpart B of 35 IAC 212 is a recodification of the former Rule 202. These regulations impose a 30 percent opacity limit for most sources.

The coke oven regulations of the Illinois SIP exempt coke oven sources from all of Rule 202 of the State of Illinois Air Pollution Control Regulations. This exemption in the state regulations was approved on September 3, 1981, (46 FR 44177) as Rule 203(d)(5)(B)(i) and is now codified as 35 IAC 212.443(a).

Currently, PM emissions from coke oven combustion stacks in Illinois are limited to 0.05 grains per dry standard cubic foot (gr/dscf). USEPA conditionally approved this limit on September 3, 1981. Currently, coke oven combustion stacks exist at LTV Steel, GCS, and Acme Steel. The LTV combustion stack is limited to a 0.03 gr/dscf by a Prevention of Significant Deterioration permit.

USEPA inspectors have observed emissions of greater than 60 percent opacity at the LTV Steel coke oven combustion stack. As recent stack tests have confirmed, this stack is not in compliance with its mass limit while emitting at this opacity. However, without the benefit of an opacity limit, enforcement was delayed for months until stack test results were obtained, even after high opacity emissions were observed.

To better assure compliance with the grain loading limit, the State needs to impose an opacity limit on the coke oven combustion stacks that is reflective of their mass emission limit.

4. USEPA considers the rules that apply to the electric arc furnace roof vents at American Steel Foundries to be unenforceable because the stacks can

not be tested for compliance. The Illinois Environmental Protection Agency (IEPA) should develop an enforceable limit that is reflective of the emissions which are in the modeled attainment demonstration.

The following enforceability comments:

a. Section 212.107, Measurement Methods for Visible Emissions, states that Method 22 should be used for "detection of visible emissions". This could be misinterpreted as requiring use of Method 22 for sources subject to opacity limits as well as sources subject to limits on detectability of visible emissions. USEPA recommends revising the language of the rule to state that "For both process emission sources and fugitive particulate matter sources, a determination as to the presence or absence of visible emissions shall be in accordance with Method 22 * * *".

b. Measurement methods for opacity, visible emissions, and "PM" are in section 212.110, and in separate sections 212.107, 212.108, and 212.109. The measurement methods in these sections are not always consistent with each other. USEPA recommends that the measurement methods in 212.107, 212.108, and 212.109 be integrated with section 212.110.

c. Several of the submitted rules contain language which exempts sources with no visible emissions from mass emissions limits. It is USEPA's understanding that the State intends for these exemptions to apply to small, well-controlled sources. However, the way the exemptions are worded, they could be misinterpreted to exclude many other sources from mass emissions limits. The rules containing these exemptions need to be clearer about exactly what sources are to be exempt, and when.

Response to Public Comments

The public comment period ended on June 24, 1994. A joint comment letter was submitted by Acme Steel Company, Granite City Division of National Steel Company, Illinois Steel Group, and LTV Steel Company (steel companies). Public comments were also received from the American Lung Association of Metropolitan Chicago (ALAMC). The comments, and USEPA responses follow.

Comment: The steel companies commented that, for various reasons, USEPA's method of estimating BOF roof monitor emissions (as described in the January 10, 1994, Technical Support Document) results in unrealistically high emissions rate estimations.

Response: The State did not include emissions from BOF roof monitors in

either the emissions inventory or the attainment demonstration. It is clear that these sources do emit significant amounts of PM. While USEPA believes the emissions estimates in the Technical Support Document to be reasonable, they are not meant to be prescriptive. The USEPA realizes that estimating BOF roof monitor emissions can be somewhat subjective, and that different methods and assumptions may be used. When Illinois revises the emissions inventory to include these sources, USEPA will determine the acceptability of Illinois' emissions estimates based on their particular technical merits.

Comment: The steel companies believe that USEPA has miscalculated the emissions from quench towers by using a 3,000 milligram per liter (mg/l) Total Dissolved Solids (TDS) concentration to determine emissions. The steel companies believe that the rules establish a maximum TDS limit of 1,200 mg/l.

Response: 35 IAC 212.443(h)(2) establishes a weekly average TDS limit of 1,200 mg/l for quench water. The Illinois rules do not establish a daily maximum concentration. The TDS concentration in quench water on any given day could greatly exceed 1,200 mg/l, without violating the weekly average limit. Because the NAAQS for PM is a 24 hour standard, the State must use the maximum allowable daily TDS concentration to determine allowable quench tower emissions. The USEPA believes that 3,000 mg/l is a reasonable estimate of the maximum allowable daily TDS concentration in quench water under the weekly average rule.

Comment: The steel companies comment that the current grain loading limit on coke oven combustion stacks is enforceable through stack tests, and excess opacity can be the basis for requiring stack tests. There is, therefore, no basis for requiring opacity limits on coke oven combustion stacks.

Response: On December 29, 1992, USEPA approved general opacity limitations for the State of Illinois under 35 IAC 212 subpart B. See 57 FR 61834. These regulations impose a 30 percent opacity limit for most sources. It was originally thought that the 30 percent opacity limit would apply to the combustion stack for the LTV coke ovens. However, the Illinois coke oven regulations of the State regulations exempt coke oven sources from the general opacity limitations. This exemption in the State regulations was approved on September 3, 1981 (46 FR 44177) as Rule 203(d)(5)(B)(i) and is now codified as 35 IAC 212.443(a). While there are currently federally enforceable grain loading limits on coke

oven combustion stacks, enforcement of these limits can be a lengthy process. Once high opacity is observed, it can still take months for stack test results to be obtained. An opacity limit would not necessarily be more stringent than the current grain loading limit, but would be more easily enforceable.

Comment: The ALAMC comments that the growth rates used by the State to predict future increases in background concentrations are unrealistically low, and that USEPA should require the State to use a realistic growth rate for background PM levels.

Response: The growth factors used by Illinois were calculated by averaging successive 5-year growth factors for the 5 years preceding the study. The USEPA agrees that this method does not result in a realistic future growth rate. As stated in this notice, the State will be required to submit, as part of the revised attainment demonstration, a demonstration that the NAAQS for PM will be protected for at least 3 years beyond the December 31, 1994, attainment date. The State must use more realistic estimations of future growth, such as projected growth rates, for the maintenance demonstration.

Comment: The ALAMC comments that the omission of mobile sources of PM from the emissions inventory is inconsistent with section 172(c)(3) of the Act and should be corrected.

Response: When compared to the major industrial sources in Illinois' PM nonattainment areas, PM emissions from mobile sources represent only a small portion of the total PM emissions. Also, the PM air quality impacts of mobile sources is a relatively constant proportion of the peak impacts, due to the more widespread or regional nature of these emissions. For these reasons, it is more reasonable to include these sources as a portion of the area's background concentration than to specifically inventory and model mobile sources. Other sources which are not specifically modeled, but are included in the area's background PM concentrations are combustion for space heating, construction activities, reentrainment of roadway dust, and windblown dust.

Comment: The ALAMC comments that reasonably available mobile source controls, including enforcement of the State's heavy duty diesel vehicle opacity limit, should have been considered or, if not considered, the State should give a reason for not doing so.

Response: In Illinois' initial study of the nonattainment areas, the State found that industrial emission sources were the dominant sources effecting air

quality in these areas. The State also found that impacts from non-industrial sources, such as automobiles and reentrained road dust on public roads and construction, were a much smaller component of peak air quality impacts. For this reason, Illinois concentrated its efforts toward quantifying emissions associated with industrial activities. Also, if the State adopts less than all available measures but demonstrates, adequately and appropriately, that Reasonable Further Progress (RFP) and attainment of the PM NAAQS is assured, and application of all such available measures would not result in attainment any faster, then a plan which requires implementation of less than all available measures may be approved.

Comment: The ALAMC comments that certain monitors may show exceedances of the annual NAAQS for PM, but this data is not statistically acceptable. ALAMC states that USEPA should require Illinois to provide statistically acceptable data from its monitors.

Response: The data requirements for determining attainment and nonattainment of the PM NAAQS can be found at 40 CFR part 50, appendix K. A minimum of 75 percent of the scheduled PM samples per quarter are required to use the computational formulas described. However, this criterion does not apply when less data is sufficient to unambiguously establish nonattainment. Nonattainment of the annual standard can be demonstrated on the basis of quarterly mean concentrations developed from observed data combined with one-half the minimum detectable concentration substituted for missing values. Therefore, even if the data doesn't meet the 75 percent requirement, it can still be used to show a violation of the annual standard.

Final Rulemaking Action

The USEPA conditionally approves the requested Lake Calumet, McCook, and Granite City nonattainment area PM SIP revision submitted on May 15, 1992.

The USEPA is not, at this time, taking action on 35 IAC 211.122. This rule, which contains definitions, has been repealed on the State level since being submitted to USEPA on May 15, 1992. The State consolidated and recodified its various definitions into other sections. These definitions have been submitted to USEPA, and USEPA approved their incorporation into the Illinois SIP on September 9, 1994 (59 FR 46562). That approval is codified at 40 CFR 52.720(c)(100). The submittal

addressed in this final rule includes the following new or revised rules:

- 35 IAC 211.101 Incorporation by Reference
- 35 IAC 212.107 Measurement Methods for Visible Emissions
- 35 IAC 212.108 Measurement Methods for PM-10 Emissions
- 35 IAC 212.109 Measurement Methods for Opacity
- 35 IAC 212.110 Measurement Methods for Particulate Matter
- 35 IAC 212.113 Incorporation by Reference
- 35 IAC 212.210 Emission Limitations for Certain Fuel Combustion Emission Sources Located in the Vicinity of Granite City
- 35 IAC 212.302 Geographical Areas of Application
- 35 IAC 212.309 Operating Program
- 35 IAC 212.316 Emission Limitations for Sources in Certain Areas
- 35 IAC 212.324 Process Emission Sources in Certain Areas
- 35 IAC 212.362 Sources in Certain Areas
- 35 IAC 212.425 Sources in Certain Areas
- 35 IAC 212.458 Sources in Certain Areas
- 35 IAC 212.464 Sources in Certain Areas
- 35 IAC 212 Illustration D McCook Vicinity Map
- 35 IAC 212 Illustration E Lake Calumet Vicinity Map
- 35 IAC 212 Illustration F Granite City Vicinity Map

The conditional approval is based on the State's enforceable commitment to meet five requirements within one year from the date of final conditional approval. The State submitted a letter on March 2, 1994, committing to meet these requirements within one year of final conditional approval. The first requirement is for the State to adopt and submit additional enforceable control measures, if necessary, that will achieve attainment. The second requirement is for the State to submit a complete and accurate emissions inventory (including corrected emissions estimates, as well as any new control measures which may be needed) and an acceptable modeled attainment demonstration. The third requirement is for the State to impose an opacity limit for coke oven combustion stacks which is reflective of their mass emission limits. The fourth requirement is for the State to provide an appropriate regulation for the electric arc furnaces at American Steel Foundries. The fifth requirement is for the State to correct the three other enforcement concerns listed above as 5(a), 5(b), and 5(c).

If the State ultimately fails to meet its commitment within one year of final conditional approval, then USEPA's action for the State's requested SIP revision will automatically convert to a final limited approval/disapproval. "Limited" approval would not mean that USEPA has approved the control measures as satisfying the specific Act requirement for the State to implement

Reasonably Available Control Measures (RACM) (including Reasonably Available Control Technology (RACT)) in moderate PM nonattainment areas. See sections 172(c)(1) and 189(a)(1)(C) of the Act. Rather, a limited approval of these measures by USEPA would mean that the emission limitations and other control measure requirements become part of the applicable implementation plan and are federally enforceable by USEPA. The USEPA may grant such a limited approval under section 110(k)(3) of the Act in light of the general authority delegated to USEPA under section 301(a) of the Act which allows USEPA to take actions necessary to carry out the purposes of the Act.

This action has been classified as a Table 2 action by the Regional Administrator under the procedures published in the Federal Register on January 19, 1989 (54 FR 2214-2225), as revised by an October 4, 1993, memorandum from Michael H. Shapiro, Acting Assistant Administrator for Air and Radiation. The OMB has exempted this regulatory action from Executive Order 12866 review.

Nothing in this action should be construed as permitting or allowing or establishing a precedent for any future request for revision to any SIP. Each request for revision to any SIP shall be considered separately in light of specific technical, economic, and environmental factors and in relation to relevant statutory and regulatory requirements.

Under section 307(b)(1) of the Clean Air Act, petitions for judicial review of this action must be filed in the United States Court of Appeals for the appropriate circuit by January 17, 1995. Filing a petition for reconsideration by the Administrator of this final rule does not affect the finality of this rule for the purposes of judicial review nor does it extend the time within which a petition for judicial review may be filed, and shall not postpone the effectiveness of such rule or action. This action may not be challenged later in proceedings to enforce its requirements. (See section 307(b)(2) of the Act.)

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Particulate matter, Reporting and recordkeeping requirements.

Dated: September 30, 1994.

Valdas V. Adamkus,
Regional Administrator.

Part 52, chapter I, title 40 of the Code of Federal Regulations is amended as follows:

PART 52—[AMENDED]

1. The authority citation for part 52 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

Subpart O—Illinois

2. Subpart O is amended by adding § 52.719 to read as follows:

§ 52.719 Identification of plan—Conditional approval.

The plan revision commitments listed in paragraph (a) of this section were submitted on the date specified.

(a) On May 15, 1992, Illinois submitted a part D particulate matter (PM) nonattainment area plan for the Lake Calumet, McCook, and Granite City moderate nonattainment areas. This plan included control measures adopted in a final opinion and order of the Illinois Pollution Control Board, on April 9, 1992, in proceeding R91-22. The USEPA is conditionally approving the State's plan, contingent on fulfillment of the State's commitment to meet 5 requirements by November 20, 1995. The first requirement is for the State to adopt and submit additional enforceable control measures, if necessary, that will achieve attainment. The second requirement is for the State to submit a complete and accurate emissions inventory (including corrected emissions estimates, as well as any new control measures which may be needed) and an acceptable modeled attainment demonstration. The third requirement is for the State to impose an opacity limit for coke oven combustion stacks which is reflective of their mass emission limits. The fourth requirement is for the State to provide an appropriate regulation for the electric arc furnaces at American Steel Foundries. The fifth requirement is for the State to correct the following three other enforcement concerns: First, section 212.107, Measurement Methods for Visible Emissions, states that Method 22 should be used for "detection of visible emissions". This could be misinterpreted as requiring use of Method 22 for sources subject to opacity limits as well as sources subject to limits on detectability of visible emissions. USEPA recommends revising the language of the rule to state that "for both process emission sources and fugitive particulate matter sources, a determination as to the presence or absence of visible emissions shall be in accordance with Method 22". Second, measurement methods for opacity, visible emissions, and "PM" are in section 212.110, and in separate sections 212.107, 212.108, and 212.109. The measurement methods in these

sections are not always consistent with each other. USEPA recommends that the measurement methods in 212.107, 212.108, and 212.109 be integrated with section 212.110. Third, several of the submitted rules contain language which exempts sources with no visible emissions from mass emissions limits. It is USEPA's understanding that the State intends for these exemptions to apply to small, well-controlled sources.

However, the way the exemptions are worded, they could be misinterpreted to exclude many other sources from mass emissions limits. The rules containing these exemptions need to be clearer about exactly what sources are to be exempt, and when. If the State fails to meet any portion of its commitment by the date listed above, the USEPA's conditional approval will automatically become a limited approval/disapproval without further regulatory action.

(1) Incorporation by reference.

(i) Illinois Administrative Code Title 35: Environmental Protection, Subtitle B: Air Pollution, Chapter 1: Pollution Control Board, Subchapter c: Emission Standards and Limitations for Stationary Sources, Part 211:

Definitions and General Provisions, Subpart A: General Provisions, Section 211.101. Adopted at 16 *Illinois Register* 7656, effective May 1, 1992. (ii) Illinois Administrative Code Title 35: Environmental Protection, Subtitle B: Air Pollution, Chapter 1: Pollution Control Board, Subchapter c: Emission Standards and Limitations for Stationary Sources, Part 212: Visible and Particulate Matter Emissions, Subpart A: General, Sections 212.107, 212.108, 212.109, 212.110, 212.113; Subpart E: Particulate Matter Emissions from Fuel Combustion Sources, Section 212.210; Subpart K: Fugitive Particulate Matter, Sections 212.302, 212.309, 212.316; Subpart L: Particulate Matter from Process Emission Sources, Section 212.324; Subpart N: Food Manufacturing, Section 212.362; Subpart Q: Stone, Clay, Glass and Concrete Manufacturing, Section 212.425; Subpart R: Primary and Fabricated Metal Products and Machinery Manufacture, Section 212.458; Subpart S: Agriculture, Section 212.464; Section 212 Illustration D: McCook Vicinity Map, Illustration E: Lake Calumet Vicinity Map, and Illustration F: Granite City Vicinity Map. Adopted at 16 *Illinois Register* 7880, effective May 11, 1992.

(b) [reserved]

[FR Doc. 94-28486 Filed 11-17-94; 8:45 am]
BILLING CODE 6660-50-P

40 CFR Part 70

[NMO01; AD-FRL-S107-4]

Clean Air Act Final Interim Approval Operating Permits Program; New Mexico Environment Department

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The EPA is promulgating interim approval of the operating permits program submitted by the New Mexico Environment Department (NMED) for the purpose of complying with Federal requirements for an approvable State program to issue operating permits to all major stationary sources, and to certain other sources with the exception of Bernalillo County and Indian Lands.

EFFECTIVE DATE: December 19, 1994.

ADDRESSES: Copies of the State's submittal and other supporting information used in developing the final interim approval are available for inspection during normal business hours at the following locations. Interested persons wanting to examine these documents should make an appointment with the appropriate office at least 24 hours before visiting day.

Environmental Protection Agency,
Region 6, Air Programs Branch (6T-AN), 1445 Ross Avenue, suite 700,
Dallas, Texas 75202-2733.
New Mexico Environment Department,
Harold Runnels Building, room So.
2100, 1190 St. Francis Drive, Santa Fe, New Mexico 87503.

FOR FURTHER INFORMATION CONTACT:
Adele D. Cardenas, New Source Review Section, Environmental Protection Agency, Region 6, 1445 Ross Avenue, suite 700, Dallas, Texas 75202-2733, telephone 214-665-7210.

SUPPLEMENTARY INFORMATION:**I. Background and Purpose****Introduction**

Title V of the 1990 Clean Air Act Amendments (sections 501-507 of the Clean Air Act ("the Act")), and implementing regulations at 40 Code of Federal Regulations (CFR) part 70 required that States develop and submit operating permits programs to EPA by November 15, 1993, and that EPA act to approve or disapprove each program within one year after receiving the submittal. The EPA's program review occurs pursuant to section 502 of the Act and the part 70 regulations, which together outline criteria for approval and disapproval. Where a program substantially, but not fully, meets the

LTV

LTV Steel Company

September 29, 1995

Dennis Lawler
Manager
Division of Air Pollution Control
Illinois Environmental Protection Agency
1340 North 9th Street
Springfield, Illinois 62702

Re: LTV Steel Chicago Coke Plant
Ceramic Welding Process

Dear Mr. Lawler:

At the August 22, 1995 meeting between representatives of IEPA and the Illinois Steel Group, the Agency proposed that opacity limits contained in IAC 35 Sec. 212, Subpart B, be applied to coke oven combustion stacks. The rule would be included in the PM₁₀ SIP and become federally enforceable. LTV Steel indicated at the time that although the Chicago Coke Plant stack normally operates well within the proposed standard, during periods of oven maintenance, specifically "ceramic welding", opacity levels frequently exceed the 30% opacity limit, and in fact often exceed the 60% opacity cap. In response to the agency's request for additional information, LTV Steel is providing the following description of the ceramic welding process.

In evaluating the environmental impact of ceramic welding, the practice can be viewed as two separate processes; 1) pressurization of the oven heating flues, which identifies the oven fissures, and 2) the actual ceramic welding process.

Oven Pressurization

Following is the typical practice conducted by LTV Steel:

- Close the waste stack damper which isolates the heating flues, for a specific oven, from the combustion stack canal.
- Reduce the combustion air inlet to about 90% closed, thereby allowing a small amount of air into the heating flues.

- Open the coke oven gas (COG) line to the flues. This allows a COG rich mixture to pressurize the flues. Under pressurization, the fuel rich mixture leaks through any cracks or fissures in the oven walls, producing a "candle-like" flame. Maintenance personnel identify oven leaks by the location of the flames.

Ceramic Welding Process

Oxygen and ceramic powder are injected through a single lance and applied to the cracks in the oven walls. The temperature of the oven wall is sufficient to cause fusion of the ceramic material with the oven refractory, thereby sealing the leaks.

It is generally agreed that the major cause of opacity in coke oven combustion stacks is a result of oven wall leaks. The practice of ceramic welding is essential to insure continued integrity of the oven walls. LTV Steel believes that it will be necessary to weld each of the 120 ovens at the Chicago Coke Plant at least once each year, on a projected schedule of 10 ovens/month. The duration of each welding event depends on the severity of the individual leak, but typically lasts from one to two hours.

Attached is a summary of ceramic welding events and opacity data as measured by the stack continuous opacity monitor, and recorded as six minute averages. The data clearly demonstrates that stack opacity levels, which appear to normally run at a nominal 5% to 10% opacity, increases to above 30% and at times above 60% opacity during periods of ceramic welding. Copies of the opacity charts are also attached. LTV Steel currently submits quarterly reports of opacity exceedances to USEPA Region V. The reports identify periods of ceramic welding, or more specifically, oven pressurization.

LTV Steel appreciates the agency's consideration of this necessary maintenance practice in developing an appropriate opacity standard for coke oven combustion stacks. Please contact me if there are any questions concerning the data or if additional information is needed.

Very truly yours,

Robert E. Sistek

Robert E. Sistek
Sr. Environmental Management Engineer

bcc: M. L. Harmon
B. L. Piccirillo
J. L. Sundholm
M. J. Thomas
S. Wash
W. L. West
D. M. Zander

(a) Plastic extrusion, rotocasting, and pultrusion equipment and associated plastic resin handling, storage, and drying equipment.

(b) Plastic injection, compression, and transfer molding equipment and associated plastic resin handling, storage, and drying equipment.

(c) Plastic blow molding equipment and associated plastic resin handling, storage, and drying equipment if the blowing gas is 1 or more of the following gasses:

- (i) Air.
- (ii) Nitrogen.
- (iii) Oxygen.
- (iv) Carbon dioxide.
- (v) Helium.
- (vi) Neon.
- (vii) Argon.
- (viii) Krypton.
- (ix) Xenon.

(d) Plastic thermoforming equipment.

(e) Reaction injection molding equipment.

R 336.1287 Permit system exemptions; surface coating equipment.

Rule 287. The permit system does not apply to any of the following:

(a) An adhesive coating line which has an application rate of less than 2 gallons per day and which has emissions that are released only into the general-in-plant environment.

(b) A surface coating process that uses only hand-held aerosol spray cans.

(c) A surface coating line if all of the following conditions are met:

(i) The coating use rate is not more than 200 gallons, as applied, minus water, per month.

(ii) Any exhaust system that serves only coating spray equipment is supplied with a properly installed and operating particulate control system.

(iii) Monthly coating use records are maintained on file for the most recent 2-year period and are made available to the air quality division upon request.

(d) A powder coating booth that has an appropriately designed and operated particulate control system and associated ovens.

(e) A silkscreen process.

(f) Replacement of waterwash control in a paint spray booth with dry filter control.

(g) Adding dry filters to paint spray booths.

(h) Replacement of a coating applicator with a coating applicator that has an equivalent or higher design transfer efficiency, unless the applicator type is specified in a permit condition.

(i) Equipment that is used for the application of a hot melt adhesive.

(j) Portable equipment that is used for the on-site painting of buildings, towers, bridges, and roads.

(k) Mixing, blending, or metering operations associated with a surface coating line.

R 336.1288 Permit system exemptions; oil and gas processing equipment.

Rule 288. The permit system does not apply to any of the following:

(a) Gas odorizing equipment.

(b) A glycol dehydrator at an oil well site that is controlled by a condenser.

(c) A sweet gas flare.

(d) Equipment for the separation or fractionation of sweet natural gas, but not including natural gas sweetening equipment.

(e) Equipment that is used for oil and gas well drilling, testing, completion, rework, and plugging activities.

R 336.1289 Permit system exemptions; asphalt and concrete production equipment.

Rule 289. The permit system does not apply to any of the following:

(a) A cold feed aggregate bin for asphalt and concrete production equipment.

(b) A liquid asphalt storage tank that is controlled by an appropriately designed and operated vapor condensation and recovery system or an equivalent control system.

(c) An asphalt concrete storage silo that has all its emissions vented back into the burning zone of the kiln or that has an equivalent control system.

R 336.1290 Permit system exemptions; sources with limited emissions.

Rule 290. The permit system does not apply to any process or process equipment that emits only noncarcinogenic volatile organic compounds if all of the following provisions are met:

(a) The uncontrolled emissions of volatile organic compounds do not exceed 1,000 pounds per month.

(b) A description of the process and equipment is maintained throughout the life of the process or process equipment.

(c) Records of material use and calculations identifying the quality, nature, and quantity of the volatile organic compound emissions are maintained in sufficient detail to demonstrate that the emissions are not more than 1,000 pounds per month.

(d) The records are maintained on file for the most recent 2-year period and are made available to the air quality division upon request.

R 336.1291 through R 336.1298.98 [Reserved]

R 336.1299 Adoption of standards by reference.

Rule 299. The following standards are adopted by reference and are available as noted:

(a) "Threshold Limit Values and Biological Exposure Indices for 1989 — 1990," pp. 11 to 43, American conference of governmental industrial hygienists. For the purposes of R 336.1232, the chemical names and threshold limit values are adopted by reference. A copy may be inspected at the Lansing office of the air quality division of the department of natural resources. A copy may be obtained from the Department of Natural Resources, P.O. Box 30028, Lansing, Michigan 48909, at a cost of \$6.00, or from the American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Building D-7, Cincinnati, Ohio 45211-4438, at a cost of \$6.00.

(b) "NIOSH Pocket Guide to Chemical Hazards," pp. 42 to 241, national institute for occupational safety and health, September, 1985. For the purposes of R 336.1232, the chemical names and NIOSH-recommended exposure levels are adopted by reference. A copy may be inspected at the Lansing office of the air quality division of the department of natural resources. A copy may be obtained from the Department of Natural Resources, P.O. Box 30028, Lansing, Michigan 48909, at a cost of \$31.00, or from the National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161, NTIS document PD 87101838, at a cost of \$31.00.

(c) "Guidelines for Carcinogen Risk Assessment," 1986, United States environmental protection agency, 51 F.R. pp. 33992 to 34003. Copies may be obtained from the Department of Natural Resources, P.O. Box 30028, Lansing, Michigan 48909, at no cost, or from CERL, Office of Resource Information, United States Environmental Protection Agency, 26 Martin Luther King Drive, Cincinnati, Ohio 45268, EPA document no. EPA 600/8-87/045, at no cost.

PART 3. EMISSION LIMITATIONS AND PROHIBITIONS — PARTICULATE MATTER

R 336.1301. Standards for density of emissions.

Rule 301. (1) Except as provided in subrules (2), (3), and (4) of this rule, a person shall not cause or permit to be discharged into the outer air from a pro-

cess or process equipment a visible emission of a density greater than the most stringent of the following:

(a) A 6-minute average of 20% opacity, except for 1 6-minute average per hour of not more than 27% opacity.

(b) A limit specified by an applicable federal new source performance standard.

(c) A limit specified as a condition of a permit to install or permit to operate.

(2) The provisions of this rule shall not apply to any process or process equipment for which fugitive visible emission limitations are specified in any other administrative rule of the commission.

(3) The provisions of subrule (1) of this rule shall not apply to visible emissions due to uncombined water vapor.

(4) Upon request by the owner of a process or process equipment for which an allowable particulate emission rate is established by R 336.1331, the commission may establish an alternate opacity. Such alternate opacity shall not be established by the commission unless the commission is reasonably convinced of all of the following:

(a) That the process or process equipment subject to the alternate opacity is in compliance or on a legally enforceable schedule of compliance with the other rules of the commission.

(b) That compliance with the provisions of subrule (1) of this rule is not technically or economically reasonable.

(c) That reasonable measures to reduce opacity have been implemented or will be implemented in accordance with a schedule approved by the commission.

R 336.1302 [Rescinded]

R 336.1303 Grading visible emissions.

Rule 303. The opacity of a visible emission shall be determined by a qualified observer and shall be certified in accordance with, and using the procedures specified in, reference method 9 or an alternative method approved by the commission.

R 336.1304 through R 336.1309.

[Reserved]

R 336.1310. Open burning.

Rule 310. (1) A person shall not cause or permit open burning of refuse, garbage, or any other waste materials, except for the burning of the following:

(a) Waste disposal of material from and at 1- or 2-family dwellings where the burning does not violate any other commission rules.

(b) Structures and other materials used exclusively for fire prevention training if prior approval is obtained from the commission.

(c) Trees, logs, brush, and stumps in accordance with applicable state and local regulations if the burning is not conducted

within a priority I area as listed in table 33, a priority II area as listed in table 34, nor closer than 1400 feet to an incorporated city or village limit and the burning does not violate any other commission rules.

(d) Beekeeping equipment and products, including frames, hive bodies, hive covers, combs, wax, and honey when burned for bee disease control.

(e) Logs, brush, charcoal, and similar materials for the purpose of food preparation or recreation.

(2) These exceptions do not authorize open burning where prohibited by local law or regulation.

R 336.1311 through R 336.1319.

[Reserved]

R 336.1320 Compliance programs.

Rule 320. (1) A person responsible for the operation of any existing process or process equipment subject to the provisions of R 336.1331, table 31, items A.3, A.4, B.5, G.2, I, and J shall submit to the commission, by January 18, 1981, a written program, acceptable to the commission, for compliance with such rule or evidence of compliance with such rule. Such evidence shall include available emission data, material balance calculations, control equipment specifications, or other information that demonstrates compliance.

(2) The program required by subrule (1) of this rule shall include the method by which compliance with such rule shall be achieved, a description of new equipment to be installed or modifications to existing equipment to be made, and a timetable which specifies, at a minimum, the following dates:

(a) The date equipment shall be ordered.

(b) The date construction or modification of equipment shall begin.

(c) The date initial start-up of equipment shall begin.

(d) The date final compliance shall be achieved, if not the same as the date specified in subdivision (c) of this subrule.

R 336.1321 through R 336.1329.

[Reserved]

R 336.1330 Electrostatic precipitator control systems.

Rule 330. (1) After July 1, 1980, it shall be unlawful to operate any cement kiln, kraft recovery boiler, lime kiln, calciner, pulverized coal-fired boiler, basic oxygen furnace, or gypsum dryer controlled by an electrostatic precipitator control system unless each transformer-rectifier set of the electrostatic precipitator is equipped with a saturable core reactor, silicon-controlled rectifier linear reactor, or equivalent type automatic control system approved by the commission. Except

for very large precipitators, each automatic controller shall be set to provide maximum power, or optimal power if operating in a sparking mode, from its respective transformer-rectifier set.

(2) Each transformer-rectifier set subject to the provisions of subrule (1) shall be capable of operating in a spark-limited mode and shall meter and display the primary RMS voltage and amperage, the average secondary amperage, and the average spark rate. The requirement to meter and display the average spark rate shall not apply if the automatic controller employs solid state circuitry to preset power levels based on sparking rate limits.

(3) The commission shall waive the requirements of subrule (2) of this rule if both of the following conditions are met:

(a) A satisfactory demonstration is made that the precipitator is capable of providing for compliance with all applicable particulate emission and opacity limits.

(b) The precipitator existed before July 1, 1979, or was covered by an application for a permit to install received by the commission before July 1, 1979.

R 336.1331 Emission of particulate matter.

Rule 331. (1) It is unlawful for a person to cause or allow the emission of particulate matter from any process or process equipment in excess of any of the following limits:

(a) The maximum allowable emission rate listed in table 31.

(b) The maximum allowable emission rate listed by the commission on its own initiative or by application. A new listed value shall be based upon the control results achievable with the application of the best technically feasible, practical equipment available. This applies only to processes and process equipment not assigned a specific emission limit in table 31.

(c) The maximum allowable emission rate specified as a condition of a permit to install or a permit to operate.

(d) The maximum allowable emission rate specified in a voluntary agreement, performance contract, stipulation, or an order of the commission.

(e) The maximum allowable emission rate as determined by table 32 for processes and process equipment not covered in subdivisions (a) to (d) of this subrule.

(2) Compliance with any emission limit required by this rule shall be determined by using the corresponding reference test method specified in table 31 or the reference test method deemed appropriate by the commission for processes or process equipment not listed in table 31.

(3) Tables 31, 32, 33, 34, and figure 31 read as follows:

TABLE 31

Particulate matter emission schedule

Process or process equipment	Capacity rating for each unit	Maximum allowable emission at operating conditions ¹ (lbs. particulate/1,000 lbs. gas except as noted)	Applicable reference test method
A. Fuel burning equipment			
1. Pulverized coal (includes cyclone furnaces)	0-1,000,000 lbs. steam per hour. Over 1,000,000 lbs. steam per hour.	See figure 31 for maximum emission limit. Apply to commission for specific emission limit.	5B or 5C
2. Other modes of firing coal (other than pulverized)	0-100,000 lbs. steam per hour. 100,000-300,000 lbs. ² steam per hour. Over 300,000 lbs. steam per hour.	0.65 until superseded by A.3 & A.4. 0.65 - 0.45 Apply to commission for specific emission limit.	5B or 5C
3. Other modes of firing coal (other than pulverized) Existing fuel-burning equipment which is in a single structure and which has a combined coal-fired existing capacity less than 250,000,000 Btu per hour.	0-20,000,000 Btu per hour input. 20,000,001 to 100,000,000 Btu per hour input. Over 100,000,000 Btu per hour input.	0.65 effective immediately. 0.45 compliance shall be achieved as expeditiously as practical, but not later than July 1, 1981. 0.30 compliance shall be achieved as expeditiously as practical, but not later than December 31, 1982.	5B or 5C 5B or 5C 5B or 5C
4. Other modes of firing coal (other than pulverized) Existing fuel-burning equipment which is in a single structure and which has a combined existing capacity equal to or greater than 250,000,000 Btu per hours.	All sizes	0.30 compliance shall be achieved as expeditiously as practical, but not later than December 31, 1982.	5B or 5C

TABLE 31 (continued)

Process or process equipment	Capacity rating for each unit	Maximum allowable emission at operating conditions ¹ (lbs. particulate/1,000 lbs. gas except as noted)	Applicable reference test method
5. Other modes of firing coal (new processes or process equipment ⁶)	All sizes	0.10	5B or 5C
6. Wood (sawdust, shavings, hogged, other) where heat input of wood fuel greater than 75% of total heat input. All other combination fuel-burning equipment that uses wood as 1 of the fuels.		0.50	5B or 5C
7. Combination fuel-firing or combination fuel/waste-firing (new process or process equipment)	All sizes	Apply to commission for specific emission limit.	
		Apply to commission for specific emission limit.,	5B or 5C
	Rating in pounds waste per hour		
B. Incinerators			
1. Residential apartments, commercial and industrial ^{3,4}	0-100	0.65	5B or 5C
2. Municipal	Over 100	0.30	5B or 5C
3. Pathological ⁵	All	0.30	5B or 5C
4. Manure drying or incineration ⁶		0.20	5B or 5C
5. Liquid waste incinerator		0.20	5B or 5C
		0.10 compliance shall be achieved as expeditiously as practical, but not later than December 31, 1982.	5B or 5C
6. Sewage sludge incinerator		0.20 compliance shall be achieved as expeditiously as practical, but not later than December 31, 1982.	5B or 5C

TABLE 31 (continued)

Process or process equipment	Capacity rating for each unit	Maximum allowable emission at operating conditions ¹ (lbs. particulate/1,000 lbs. gas except as noted)	Applicable reference test method
C. Steel manufacturing			
1. Basic oxygen furnaces		0.057 ¹¹	5D
A. Primary control equipment ¹²		0.038 ¹¹	5D
B. Secondary control equipment ¹³			
C. Primary control equipment if also used to control charging and tapping emissions		0.057 ¹¹	5D
2. Electric furnaces		0.057 ¹¹	5D
A. Primary control equipment ¹⁴		0.010 ¹¹	5D or 5E
B. Secondary control equipment ¹⁵			
C. Primary control equipment if also used to control charging and tapping emissions		0.010 ¹¹	5D or 5E 14
3. New sintering plants ⁶		0.067 ¹¹	5D or 5E
A. Main windbox		0.038 ¹¹	5D
B. Discharge			
4. Existing sintering plants		0.125 ¹¹	5D
A. Main windbox & discharge			
5. Blast furnaces		0.02	5D
Blast furnace casthouse air cleaning device ¹⁷		0.095	5D
6. Coke oven combustion stacks		0.10 lbs./ton of coke	5D
7. Coke oven push control equipment		1,500 ⁸	See footnote 16
8. Coke oven quench towers		or 1,500 ¹⁰	See footnote 16
9. Scarfing operations		0.057 ¹¹	5D during scarfing operation

TABLE 31 (continued)

Process or process equipment	Total plant melt rate in tons/hour	Maximum allowable emission at operating conditions ¹ (lbs. particulate/1,000 lbs. gas except as noted)	Applicable reference test method
<u>D. Ferrous cupola foundry operations</u>			
1. Existing production cupolas ⁷	0-10	0.40	5B or 5C
	10-20	0.25	5B or 5C
	Over 20	0.15	5B or 5C
2. Existing jobbing cupolas ⁷		0.40	5B or 5C
3. Electric arc melting		0.10	5B or 5C
4. Sand handling		0.10	5B or 5C
5. All new cupolas ⁶	0-15	1.8 - 0.7 ^{2,8}	5B or 5C
	Over 15	0.7 ⁸	5B or 5C
<u>E. Chemical and mineral kilns</u>		0.20	5B or 5C
<u>F. Asphalt paving plants</u>			
1. Located within a priority I or II area (before January 1, 1980)		0.30	5B or 5C
2. Located within a priority I or II area (after January 1, 1980)		0.10	5B or 5C
3. Located outside priority I and II areas		0.30	5B or 5C
<u>G. Cement manufacture</u>			
1. Kiln - wet or dry process		0.25	5B or 5C
2. Clinker coolers (before January 1, 1981)		0.30	5B or 5C
(after January 1, 1981)		0.10	5B or 5C
3. Grinding, crushing, and other material handling.		0.15	5B or 5C

TABLE 31 (continued)

Process or process equipment	Gas flow rate (SCFM)	Maximum allowable emission at operating conditions ¹ (lbs. particulate/1,000 lbs. gas except as noted)	Applicable reference test method
H. <u>Iron ore pelletizing</u> Grate kilns and traveling grates	Over 600,000 300,000-600,000 100,000-300,000 0-100,000	Apply to commisison for specific emission limit. 0.10 0.15 0.20	5B or 5C 5B or 5C 5B or 5C
I. <u>Fertilizer plants (includes ammoniator, granulator, reactor, dryer, cooler blender and all other processes)</u> Compliance shall be achieved as expeditiously as practical, but not later than January 1, 1981.		0.10	5B or 5C
J. <u>Exhaust systems serving material handling equipment not otherwise listed in table 31</u> Compliance shall be achieved as expeditiously as practical, but not later than July 1, 1981.		0.10	5B or 5C

Footnotes:

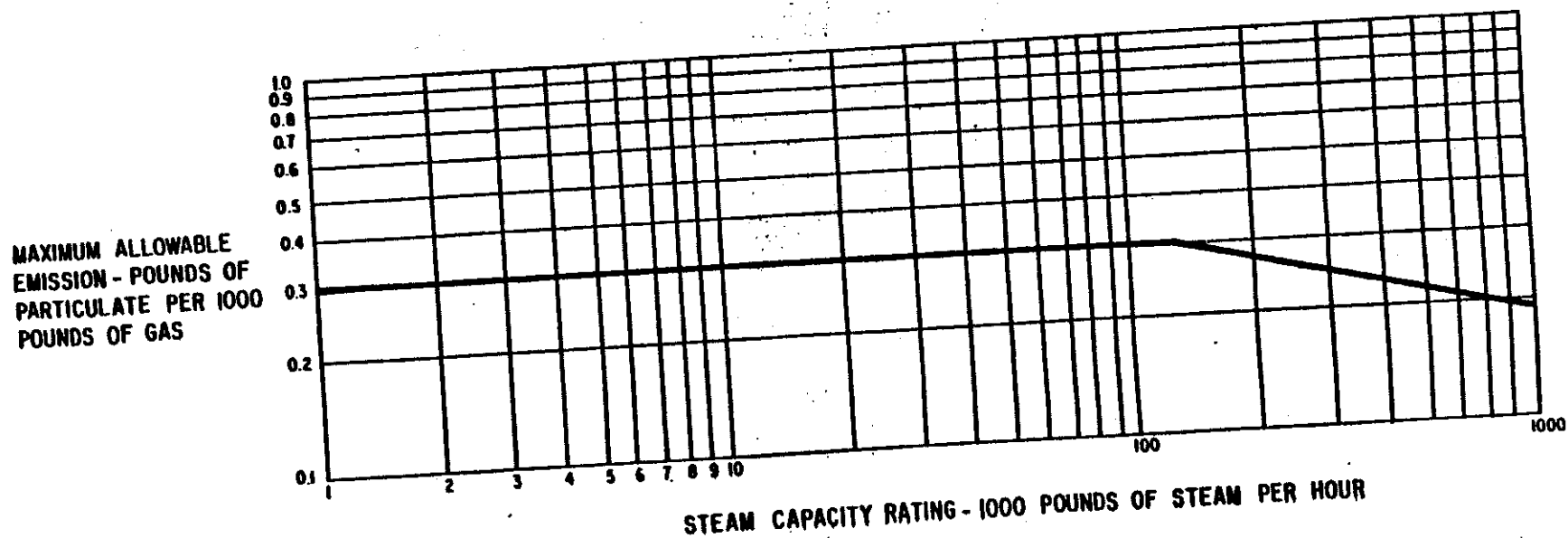
¹Fuel burning and incineration limitation shall be calculated to 50% excess air.²Emission limitations for specific ratings are determined by linear interpolation between the ranges shown.³These emission limitations do not apply to domestic incinerators (defined as having not more than 5 cubic feet of storage capacity).

TABLE 31 (continued)

Footnotes (continued):

- ⁴Afterburner or approved equivalent is mandatory.
- ⁵Differentiation between jobbing and production foundries.
Cupolas used in a jobbing foundry are the same as those used in a production foundry and vary in size only according to the quantity of iron melted per hour.
However, the cupolas in a jobbing foundry are run intermittently just long enough at one time to pour the molds that are ready on the foundry floor, job by job. This might be for a 2- to 4-hour period per day for any number of days per week.
Production foundry cupolas melt continuously to pour a succession of molds that are constantly being prepared to reserve this continuous flow of iron. This could become 8 hours, 16 hours, or 24 hours per day for any number of days per week.
- ⁶New processes or process equipment are defined as those for which the permit to install was issued after January 18, 1980.
- ⁷Any existing cupolas are considered to be in compliance with table 31 of rule 331 if they meet the particulate emission limit for new cupolas.
- ⁸Pounds of particulate per ton of charged material.
- ⁹Milligrams per liter of total dissolved solids in the quench water.
- ¹⁰Milligrams per liter of total dissolved solids in the make-up water.
- ¹¹Compliance shall be determined by means of a comparison between the emission limit and the measured emission rate calculated on a dry basis (pounds particulate per 1,000 pounds dry gas).
- ¹²"Primary control equipment", as applied to basic oxygen furnaces, means the control equipment designed to capture and control particulate emissions during oxygen blowing.
- ¹³"Secondary control equipment", as applied to basic oxygen furnaces, means the control equipment designed to capture and control particulate emissions during process steps other than oxygen blowing.
- ¹⁴"Primary control equipment", as applied to electric furnaces, means the control equipment designed to capture and control particulate emissions during meltdown and refining.
- ¹⁵"Secondary control equipment", as applied to electric furnaces, means the control equipment designed to capture and control particulate emissions during process steps other than meltdown and refining.
- ¹⁶"Standard Methods for the Examination of Water and Wastewater" (14th edition) section 208C, as modified in R 336.2033, shall be used as the applicable test method.
- ¹⁷The mass emission limit specified is not applicable where fume suppression technology, approved by the commission, is used to control blast furnace casthouse emissions.

FIGURE 31



Note: It is required that a maximum allowable emission listing be applied for to the air pollution control commission for all pulverized coal (and cyclone) furnaces having capacity ratings in excess of 1 million pounds of steam per hour.

TABLE 32

Allowable rate of emission based on process weight rate^a

Process weight rate		Rate of emission	Process weight rate		Rate of emission
Lb/hr	Tons/hr	Lb/hr	Lb/hr	Tons/hr	Lb/hr
100	0.05	0.55	16,000	8.0	16.5
200	0.10	0.88	18,000	9.0	17.9
400	0.20	1.40	20,000	10.0	19.2
600	0.30	1.83	30,000	15.0	25.2
800	0.40	2.22	40,000	20.0	30.5
1,000	0.50	2.58	50,000	25.0	35.4
1,500	0.75	3.38	60,000	30.0	40.0
2,000	1.00	4.10	70,000	35.0	41.3
2,500	1.25	4.76	80,000	40.0	42.5
3,000	1.50	5.38	90,000	45.0	43.6
3,500	1.75	5.95	100,000	50.0	44.6
4,000	2.00	6.52	120,000	60.0	46.3
5,000	2.50	7.58	140,000	70.0	47.8
6,000	3.00	8.56	160,000	80.0	49.0
7,000	3.50	9.49	200,000	100.0	51.2
8,000	4.00	10.40	1,000,000	500.0	69.0
9,000	4.50	11.20	2,000,000	1,000.0	77.6
10,000	5.00	12.00	6,000,000	3,000.0	92.7
12,000	6.00	13.60			

^aInterpolation of the data in this table for process weight rates up to 60,000 lb/hr shall be accomplished by use of the equation $E = 4.10 P^{0.67}$ and interpolation and extrapolation of the data for process weight rates in excess of 60,000 lb/hr shall be accomplished by use of the equation $E = 55.0 P^{0.11}$ - 40, where E = rate of emission in lb/hr and P = process weight in tons/hr.

Process weight - The total amount of all material introduced into a process, including solid fuels, but excluding liquid fuels and gaseous fuels when these are used as fuels and air introduced for purposes of combustion.

Process weight rate - For continuous or long-term operation: The total process weight for the entire period of operation or for a typical portion thereof, divided by the number of hours of such period or portion thereof. For batch operations: The total process weight for a period which covers a complete operation or an integral number of cycles, divided by the hours of actual process operation during such period.

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TABLE 33
Priority I areas

County	Area
Calhoun	T2S, R4W, Section 34.
Genesee	Starting on Industrial Avenue, north to Stewart Avenue, east to Hitchcock Street, south to Olive Avenue (extended), south to Robert T. Longway Boulevard, west and southwest to Industrial Avenue.
Lapeer	T7N, R12E, that portion of Section 17 which lies south of M-21 and east of Fairground Road.
Monroe	Starting where Sandy Creek empties into Lake Erie, northwest to Maple Avenue (extended north-northwest), southwest to Elm Avenue, west to Herr Road, south to Dunbar Road and east to Plum Creek (which empties into Lake Erie).
Saginaw	Starting at Tittabawassee Road, east to I-75, east and south to Washington Avenue, west to 6th Street, north to Carrolton Street, northeast to Zilwaukee Street, north to Westervelt Street north to Tittabawassee Road.
Wayne	Area included within the following (counter clockwise): Lake St. Clair to Moross Road to Seven Mile Road to VanDyke Road to Eight Mile Road to Wyoming Road to Seven Mile Road to Schaeffer Road to Fenkell Road to Greenfield Avenue to Joy Road to Southfield Expressway to Ford Road to Telegraph Road to Cherry Hill Road to Beech-Daly Road (extended) to Michigan Avenue to Inkster Road to Carlisle Street to Middle Belt Road to Vanborn Road to Wayne Road to Pennsylvania Road to Middle Belt Road to Sibley Road to Telegraph Road to King Road to Grange Road to Sibley Road to Jefferson Avenue to Bridge Street (Grosse Ile) extended to Detroit River.

TABLE 34
Priority II areas

County	Area
Bay	T14N, R5E, Sections 14-16 and 21-23.
Delta	T39N, R22W, Sections 19, 30, south one-half of 17, and south one-half of 18.
Genesee	Starting on Industrial Avenue, north to Pierson Road, east to Dort Highway, south to Hitchcock Street, south to Olive Avenue (extended), south to Robert T. Longway Boulevard, west and southwest to Industrial Avenue.
Macomb	T4N, R14E, Sections 27, 28, 33, and 34.

Manistee	T21N, R16W, Sections 7, 18, and 19; T21N, R17W, Sections 12 and 13.
Midland	T14N, R2E, Sections 14-16, 21-23, 26-28, and 33-35.
Monroe	T5S, R10E, Sections 8, 9, and 15-17.
Muskegon	T9N, R16W, Sections 5 and 6; T10N, R16W, Sections 21, 22, and 27-34.
Saginaw	Northeast section: starting on Tittabawassee Road, east to I-75, south to Wadsworth Avenue, west to I-675, west and north to Tittabawassee Road. Southwest section: T12N, R4E, the eastern half of Section 34 (that which is east of Maple Street) and Section 35.
St. Clair	T6N, R17E, Sections 2-4, 9-11, 14-16, 21, 22, and 28.
Wayne	The area included within the following (counter clockwise): Lake St. Clair to Eight Mile Road to Schaeffer Road to McNichols Road to Greenfield Avenue to Schoolcraft Avenue to Evergreen Road to Joy Road to Telegraph Road to Ford Road to Beech-Daly Road to Cherry Hill Road to Inkster Road to Carlisle Street to Middle Belt Road to VanBorn Road to Wayne Road to Ecorse Road to Haggerty Highway to Tyler Road to Belleville Road to I-94 to Rawsonville Road to Oakville Waltz Road to Will Carleton Road to the Huron River to Lake Erie, except subarea listed in table 33.

R 336.1332 through R 336.1348.
[Reserved]

R 336.1349. Coke oven compliance date.

Rule 349. A person subject to the provisions of rules 350 to 357 shall achieve compliance with such rules as expeditiously as practical, but not later than December 31, 1982.

R 336.1350 Emissions from larry-car charging of coke ovens.

Rule 350. (1) During a charging period of a coke oven, a person shall not cause or permit to be discharged into the outer air any visible emission from any larry-car or charging holes, except that a visible emission may be emitted for a period or periods aggregating 100 seconds during any 4 consecutive charging periods on a coke battery.

(2) Compliance with the limit specified in this rule shall be determined using reference test method 9B.

R 336.1351 Charging hole emissions from coke ovens.

Rule 351. (1) A person shall not cause or permit to be discharged into the outer air any visible emission from any coke oven charging hole, except that visible emissions may be emitted from not more than 4% of all charging holes on a coke battery.

(2) Compliance with the limit specified in this rule shall be determined using reference test method 9B.

R 336.1352 Pushing operation fugitive emissions from coke ovens.

Rule 352. (1) During a pushing operation, a person shall not cause or permit to be discharged into the outer air, from an opening between the oven and the coke receiving car or from the coke-receiving car, a visible emission with a density more than 25% opacity, except that during pushing operation of any 8 consecutive observed pushing operations shall be permitted to exceed this requirement.

(2) A person shall not cause or permit to be discharged into the outer air, from the coke in any coke-receiving car as it travels from the oven to the quench tower, a visible emission with a density of more than 25% opacity, except that 1 trip to quench tower in any 8 consecutively served trips per battery shall be permitted to exceed this requirement.

(3) Compliance with the limits specified in this rule shall be determined using reference test method 9B.

R 336.1353 Standpipe assembly emissions during coke cycle from coke ovens.

Rule 353. (1) During a coking cycle, a person shall not cause or permit to be discharged into the outer air any visible emission from any standpipe assembly except that visible emissions may be emitted from a number of standpipe assembly emission points on the coking cycle not exceed 4% of all standpipe assembly emission points on the operating ovens coke battery.

(2) Compliance with the limit specified in this rule shall be determined using reference test method 9B.

R 336.1354 Standpipe assembly emissions during decarbonization from coke ovens.

Rule 354. A person shall not cause or permit any standpipe lid to be open during decarbonization on any coke oven which

more than 3 ovens ahead of the oven being pushed.

R 336.1355 Coke oven gas collector main emissions from coke ovens.

Rule 355. A person shall not cause or permit to be discharged to the outer air any visible emission from the coke oven gas collector main, except when spooning the main or when the emergency relief valve opens.

R 336.1356 Coke oven door emissions from coke ovens; doors that are 5 meters or shorter.

Rule 356. (1) A person shall not cause or permit to be discharged into the outer air any visible emission from pushside door, cokeside door, or leveling door serving a coke oven equipped with doors that are 5 meters or shorter, with the following exceptions:

(a) A visible emission may be emitted from not more than 10% of the total pushside doors on the coke battery.

(b) A visible emission may be emitted from not more than 10% of the total cokeside doors on the coke battery.

(c) A visible emission may be emitted from not more than 10% of the total leveling doors on the coke battery.

(2) Visible emissions emanating from the doors of a coke oven that has been pipeline charged within 1 hour of the time of observation shall not be considered when calculating the percentage of doors leaking.

(3) Compliance with the limits specified in subrule (1) of this rule shall be determined using reference test method 9B.

R 336.1357 Coke oven door emissions from coke ovens; doors that are taller than 5 meters.

Rule 357. (1) A person shall not cause or permit to be discharged into the outer air any visible emission from any pushside door, cokeside door, or leveling door serving a coke oven equipped with doors that are taller than 5 meters, with the following exceptions:

(a) A visible emission may be emitted from not more than 12% of the total pushside doors on the coke battery.

(b) A visible emission may be emitted from not more than 12% of the total cokeside doors on the coke battery.

(c) A visible emission may be emitted from not more than 10% of the total leveling doors on the coke battery.

(2) A person shall not cause or permit the operation of a coke battery equipped with coke oven doors taller than 5 meters, unless both of the following provisions are met:

(a) There is access to a facility to maintain and repair doors and buckstays.

(b) An inventory of cleaned and repaired doors is maintained to comply with all of the following:

(i) The number of inventoried pushside doors exceeds 5% of the number of pushside doors in service.

(ii) The number of inventoried cokeside doors exceeds 5% of the number of cokeside doors in service.

(iii) The number of inventoried leveling doors exceeds 5% of the number of leveling doors in service.

(3) Compliance with the limits specified in subrule (1) of this rule shall be determined using reference test method 9B.

R 336.1358 Roof monitor visible emissions at steel manufacturing facilities from electric arc furnaces and blast furnaces.

Rule 358. (1) A person shall not cause or permit to be discharged to the outer air, at a steel manufacturing facility, from a roof monitor source of emission of an electric arc furnace, or a blast furnace, a visible emission with a density of more than 20% opacity.

(2) Compliance with the limit of this rule shall be determined using reference test method 9 as described in R 336.2004(1)(h).

R 336.1359 Visible emissions from scarfer operation stacks at steel manufacturing facilities.

Rule 359. (1) A person shall not cause or permit to be discharged to the outer air, from a scarfer operation stack at a steel manufacturing facility, a visible emission with a density of more than 25% opacity.

(2) Compliance with the limit of this rule shall be determined using reference test method 9A.

R 336.1360 Visible emissions from coke oven push stacks.

Rule 360. (1) A person shall not cause or permit to be discharged to the outer air,

from a coke oven push stack, a visible emission with a density of more than 20% opacity.

(2) Compliance with the limit specified in this rule shall be determined using reference test method 9B.

R 336.1361 Visible emissions from blast furnace casthouse operations at steel manufacturing facilities.

Rule 361. (1) A person shall not cause or permit to be discharged to the outer air from a blast furnace stack a visible emission with a density of more than 10% opacity.

(2) Compliance with the limit of this rule shall be determined using reference method 9 as described in R 336.2004(1)(h).

R 336.1362 Visible emissions from electric arc furnace operations at steel manufacturing facilities.

Rule 362. (1) A person shall not cause or permit to be discharged to the outer air from an electric arc furnace stack, a visible emission with a density of more than 10% opacity.

(2) Compliance with the limit of this rule shall be determined using reference method 9 as described in R 336.2004(1)(h).

R 336.1363 Visible emissions from argon-oxygen decarburization operations at steel manufacturing facilities.

Rule 363. (1) A person shall not cause or permit to be discharged to the outer air from an argon-oxygen decarburization stack, a visible emission with a density of more than 10% opacity.

(2) Compliance with the limit of this rule shall be determined using reference method 9 as described in R 336.2004(1)(h).

R 336.1364 Visible emissions from basic oxygen furnace operations.

Rule 364. (1) A person shall not cause or permit to be discharged to the outer air from a basic oxygen furnace secondary control device, a visible emission with a density of more than 20% opacity.

(2) A person shall not cause or permit to be discharged to the outer air, from a basic oxygen furnace shop roof monitor, a visible emission with a density of more than 20% opacity.

(3) Compliance with the limits of this rule shall be determined using reference method 9C.

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R 336.1365 Visible emissions from hot metal transfer operations at steel manufacturing facilities.

Rule 365. (1) A person shall not cause or permit to be discharged to the outer air, from a hot metal transfer operation stack, a visible emission with a density of more than 20% opacity.

(2) A person shall not cause or permit to be discharged to the outer air from a building or enclosure containing a hot metal transfer operation, a fugitive visible emission with a density of more than 20% opacity.

(3) Compliance with the limits of this rule shall be determined using reference method 9C.

R 336.1366 Visible emissions from hot metal desulphurization operations at steel manufacturing facilities.

Rule 366. (1) A person shall not cause or permit to be discharged to the outer air, from a hot metal desulphurization operation stack, a visible emission with a density of more than 20% opacity.

(2) A person shall not cause or permit to be discharged to the outer air from a building or enclosure containing a hot metal desulphurization operation, a fugitive visible emission with a density of more than 20% opacity.

(3) Compliance with the limits of this rule shall be determined using reference method 9C.

R 336.1367 Visible emissions from sintering operations.

Rule 367. (1) A person shall not cause or permit to be discharged to the outer air, from a sintering operation control device, a visible emission with a density of more than 20% opacity.

(2) A person shall not cause or permit to be discharged to the outer air, from a sintering operation, a fugitive visible emission with a density of more than 20% opacity.

(3) Compliance with the limits of this rule shall be determined using reference method 9 as described in R 336.2004(1)(h).

**R336.1368 and R 336.1369. [Reserved]
R336.1370 Collected air contaminants.**

Rule 370. (1) Collected air contaminants shall be removed as necessary to maintain the equipment as the required

operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air.

(2) At a minimum, in priority I and II areas listed in tables 33 and 34, the use of 1 or more of the following material handling methods is required for the transport of collected air contaminants:

(a) Enclosed trucking or transporting vehicles.

(b) Enclosed, pneumatic, or screw conveying transporting equipment.

(c) Water or dust suppressant sprays.

(d) An acceptable method which is equivalent to the methods listed in subdivisions (a), (b), and (c) of this subrule.

R 336.1371 Fugitive dust control programs other than areas listed in table 36.

Rule 371. (1) Based on ambient air quality measurements or substantive complaints, the commission may request that the person who is responsible for the operation of any facility which processes, uses, stores, transports, or conveys bulk materials, such as, but not limited to, coal, coke, metal ores, limestone, cement, sand, gravel, and material from air pollution control devices, or a facility which has activities specifically identified in R 336.1372 and which facility is in an area not listed in table 36, submit a fugitive dust control program. The commission shall notify the person who is responsible for the operation of the facility of the provisions of R 336.1372 which apply to the facility and the reasons for the commission's notification. Except as provided in subrule (3) of this rule, the control program shall be submitted to the commission not later than 6 months after notification.

(2) A fugitive dust control program which is required by subrule (1) of this rule shall be in writing and shall provide for all of the following:

(a) Using 1 or more combinations of available technologies operating practices, or methods listed in R 336.1372 as are reasonably necessary to control fugitive dust emissions.

(b) Consideration of the quantity, moisture content, specific gravity, and the particle size distribution of the bulk materials. The more friable, drier, lighter, and finer the bulk material is, the more effective the fugitive dust control methods incorporated into the control program shall be.

(c) The keeping and maintenance of records consistent with the various activities to be implemented under the control program.

(d) Identification of the control technologies, methods, or control equipment, if any, to be implemented or installed and the schedule, including increments of progress, for implementation or installation.

(3) Within 3 months following notification by the commission that a fugitive dust control program is required, the person who is responsible for operating the facility has the opportunity to demonstrate, to the satisfaction of the commission, that any part of the facility is not subject to the provisions of this rule.

(4) If a control program is not submitted within 6 months after notification by the commission, the commission may proceed, pursuant to the act, toward the entry of a final order which contains a control program that meets the requirements of subrule (2) of this rule.

(5) The control program is subject to review and approval by the commission. The commission shall approve a control program only upon the entry of a legally enforceable order or as part of an approved permit to install or operate. If, in the opinion of the commission, the program does not adequately meet the requirements set forth in subrule (2) of this rule, the commission may disapprove the program, state its reasons for disapproval, and require the preparation and submission of an amended program within a specified time period. If, within the specified time period, an amended program is either not submitted or is submitted but, in the opinion of the commission, fails to meet the requirements of subrule (2) of this rule, the commission may proceed, pursuant to the act, toward the entry of a final order which contains a control program that meets these requirements.

(6) After approval by the commission, the person who is responsible for the preparation of the control program shall begin implementation of the program pursuant to the schedule contained in the control program.

(7) Either the person who is responsible for a facility or the commission may request a revision to a commission-approved control program to meet changing conditions. The commission shall review the revision following the requirements of subrule (5) of this rule.

(8) Table 36 reads as follows:

TABLE 36

<u>County</u>	<u>Area</u>
Bay	T14N, R5E, Sections 14-16 and 21-23.
Calhoun	T2S, R4W, Section 34.
Delta	T39N, R22W, Sections 19, 30, south one-half of 17, and south one-half of 18.
Genesee	Starting on Industrial Avenue, north to Pierson Road, east to Dort Highway, south to Hitchcock Street, south to Olive Avenue (extended), south to Robert T. Longway Boulevard, west and southwest to Industrial Avenue.
Lapeer	T7N, R12E, that portion of Section 17 which lies south of M-21 and east of Fairground Road.
Macomb	T4N, R14E, Sections 27, 28, 33, and 34.
Manistee	T21N, R16W, Sections 7, 18, and 19; T21N, R17W, Sections 12 and 13.
Midland	T14N, R2E, Sections 14-16, 21-23, 26-28, and 33-35.
Monroe	Starting where Sandy Creek empties into Lake Erie, northwest to Maple Avenue (extended north-northeast), southwest to Elm Avenue, west to Herr Road, south to Dunbar Road and east to Plum Creek (which empties into Lake Erie).
Muskegon	T9N, R16W, Sections 5 and 6; T10N, R16W, Sections 21, 22, and 27-34.
Saginaw	Northeast section: starting on Tittabawassee Road, east to I-75, south to Wadsworth Avenue, west to I-675, west and north to Tittabawassee Road. Southwest section: T12N, R4E, the eastern half of Section 34 (that which is east of Maple Street) and Section 35.
St. Clair	T6N, R17E, Sections 2-4, 9-11, 14-16, 21, 22, and 28.
Wayne	Area included within the following (counter clockwise): Lake St. Clair to Moross Road to Seven Mile Road to Vandyke Road to Eight Mile Road to Wyoming Road to Seven Mile Road to Schaeffer Road to Penkell Road to Greenfield Avenue to Joy Road to Southfield Expressway to Ford Road to Telegraph Road to Cherry Hill Road to Beech-Daly Road (extended) to Michigan Avenue to Inkster Road to Carlisle Street to Middle Belt Road to Vanborn Road to Wayne Road to Pennsylvania Road to Middle Belt Road to Sibley Road to Telegraph Road to King Road to Grange Road to Sibley Road to Jefferson Avenue to Bridge Street (Grosse Ile) extended to Detroit River. Also included is that portion of the City of Riverview which is south of Sibley Road and the City of Trenton.

R 336.1372 Fugitive dust control program; required activities; typical control methods.

Rule 372. (1) A fugitive dust control program which is required by R 336.1371 and which deals with 1 or more of the fugitive dust sources listed in this rule may include any of the typical control methods listed in this rule for that source.

(2) The following provisions apply to the loading or unloading of open storage piles of bulk materials as a source of fugitive dust:

(a) Open storage piles of bulk materials, hereinafter referred to as "piles", which meet any of the following 3 conditions need not be included in a fugitive dust control program:

(i) All piles of the same material at a manufacturing or commercial location which have a total volume of less than 100 cubic meters (131 yards³).

(ii) Any piles at a manufacturing or commercial location if the total annual volumetric throughput of all the stored material at the site is less than 10,000 cubic meters (13,100 yards³).

(iii) Any single pile at a manufacturing or commercial location that has a volume less than 42 cubic meters (55 yards³).

(b) Typical control methods for controlling fugitive emissions resulting from the loading or unloading of piles may include, but are not limited to, the following:

(i) Completely enclosing the pile within a building furnished with commission-approved air pollution control equipment.

(ii) Using pneumatic conveying or telescopic chutes.

(iii) Spraying the working surface of the pile with water or dust-suppressant compound.

(iv) Directing engine exhaust gases that are generated by the machine used on the piles for loading or unloading upwards.

(v) Minimizing the drop distance from which the material is discharged into the pile. The drop distance shall be specified in the control program.

(vi) Periodic removal of spilled material in areas within 100 meters (328 feet) from the pile. The frequency of removal shall be specified in the control program.

(3) The following provisions apply to the transporting of bulk materials as a source of fugitive dust:

(a) Trucks with less than a 2-ton capacity that are used to transport sand, gravel, stones, peat, and topsoil are exempt from the provisions of this subrule.

(b) Typical control methods for controlling fugitive emissions resulting from the transporting of bulk materials by truck

may include, but are not limited to, the following:

(i) Completely covering open-bodied trucks.

(ii) Cleaning the wheels and the body of each truck to remove spilled materials after the truck has been loaded.

(iii) Use of completely enclosed trucks.

(iv) Tarping the truck when operating empty if residue has not been completely removed after emptying.

(v) Cleaning the residue from the inside of the truck after emptying.

(vi) Loading trucks so that no part of the load making contact with any sideboard, side panel, or rear part of the load enclosure comes within 6 inches of the top part of the enclosure.

(vii) Maintaining tight truck bodies so that leakages within the body will be eliminated and future leakages prevented.

(viii) Spraying the material being transported in a vehicle with a dust suppressant. The frequency of spraying shall be specified in the control program.

(ix) Restricting the speed of the vehicle which transports the material. The speed of the vehicle shall be specified in the control program.

(4) The following provision applies to outdoor conveying as a source of fugitive dust: Typical control methods for controlling fugitive emissions resulting from conveying bulk materials may include, but are not limited to, the following:

(a) Completely enclosing all conveyor belts and equipping them with belt wipers and hoppers of proper size to prevent excessive spills.

(b) Enclosing transfer points and, if necessary, exhausting them to a baghouse or similar control device at all times when the conveyors are in operation.

(c) Equipping the conveyor belt with not less than 210-degree enclosures.

(d) Restricting the speed of conveyor belts. The belt speed shall be specified in the control program.

(e) Periodically cleaning the conveyor belt to remove the residual material. The frequency of cleaning shall be specified in the control program.

(f) Minimizing the distance between transfer points. The distance between transfer points shall be specified in the control program.

(g) Removing the spilled material from the ground under conveyors. The frequency of removal shall be specified in the control program.

(5) The following provisions apply to roads and lots as sources of fugitive dust:

(a) Roads and lots which are located within industrial, commercial, and government-owned facilities and which meet the following 2 conditions are not subject to the requirement of submitting a fugitive dust control program:

(i) The traffic volume is less than 1 vehicle per day on a monthly average.

(ii) The lots are less than 500 square meters (5,382 feet²) in area.

(b) Typical control methods for controlling fugitive emissions resulting from roads and lots located within industrial, commercial, and government-owned facilities may include, but are not limited to, the following:

(i) Paving roads and parking lots with hard material, such as concrete, asphalt, or an equivalent which is approved by the commission.

(ii) Mechanically cleaning paved surfaces by vacuum sweeping, wet sweeping, or flushing. The frequency of cleaning shall be specified in the control program.

(iii) Washing the wheels of every truck leaving the plant premises.

(iv) Treating the roads and lots with a dust-suppressant compound which is approved by the commission. The frequency of application shall be specified in the control program.

(v) Periodically maintaining off-road surfaces with gravel where trucks have frequent access. The frequency of maintenance shall be specified in the control program.

(6) The following provisions apply to active storage piles as sources of fugitive dust:

(a) Inactive storage piles that are less than or equal to 500 cubic meters (646 yards³) in volume are not subject to the requirement of submitting a fugitive dust control program.

(b) Typical control methods for controlling fugitive emissions resulting from inactive storage piles may include, but are not limited to, the following:

(i) Completely covering the pile with paulin or other material approved by the commission.

(ii) Completely enclosing the pile within a building.

(iii) Enclosing the pile with not less than 3 walls so that no portion of the material is higher than the walls.

(iv) Periodically spraying the pile with water or other dust-suppressant compound approved by the commission. The frequency of application shall be specified in the control program.

(v) Growing vegetation on and around the pile.

(7) The following provisions apply to building ventilation as a source of fugitive dust:

(a) This subrule is applicable to all of the following:

- (i) Ferrous and nonferrous foundries.
- (ii) Electric arc furnaces, blast furnace casthouses, sinter plants, and basic oxygen processes at iron and steel production facilities.
- (iii) Metal heat treating.
- (iv) Metal forging.
- (v) Bulk material handling, storage, drying, screening, and crushing.
- (vi) Metal fabricating and welding.
- (vii) Briquetting, sintering, and pelletizing operations.
- (viii) Machining and pressing of metal.
- (ix) Stone, clay, and glass production.

(x) Lime, cement, and gypsum production

(xi) Chemical and allied product production.

(xii) Asphalt and concrete mixing operations.

(b) Typical control methods for controlling fugitive emissions resulting from building openings, such as roof monitors, powered and unpowered ventilators, doors, windows, and holes in the building structure integrity, may include, but are not limited to, the following:

(i) Exhausting the entire building to a dust collection system which is acceptable to the commission.

(ii) Using local hoods connected to a dust collection system to capture emissions within the building.

(iii) Establishing and maintaining operating procedures and internal housekeeping practices (specify details).

(iv) Installing removable filter media across the vent openings.

(8) The following provisions apply to fugitive dust emissions from construction, renovation, or demolition activities located in priority I areas:

(a) This subrule is applicable to the owner or prime contractor, except for those owners or prime contractors who construct, renovate, or demolish less than 12 single-family dwelling units per year.

(b) Typical control methods for controlling fugitive dust emissions from construction, renovation, or demolition activities may include, but are not limited to, the following:

(i) Spraying of all work areas with water or other dust-suppressant compound which is approved by the commission.

(ii) Completely covering the debris, excavated earth, or other airborne materials with tarpaulin or any other material which is approved by the commission.

(iii) Any other method acceptable to the commission.

R 336.1373 Fugitive dust control requirements; areas listed in table 36.

Rule 373. (1) A person shall not cause or allow the emission of fugitive dust from any process which is located in an area listed in table 36 of R 336.1371, including any material handling or storage activity, that has an opacity equal to, or in excess of, 5% as observed by an observer looking generally toward the zenith at a point beyond the property line of the emission source.

(2) Except for operations involving grain handling and grain drying, a person responsible for all mining operations, standard industrial classification major groups 10 through 14; manufacturing operations, standard industrial classification major groups 20 through 39; and electric generating operations, standard industrial classification group 491, which are located in areas listed in table 36 of R 336.1371, shall control fugitive dust emissions to comply with all of the following applicable provisions:

(a) Potential sources of fugitive dust shall be maintained and operated so as to comply with all of the following applicable provisions:

(i) All storage piles of materials, where the total uncontrolled emissions of fugitive dust from all such piles at a facility is in excess of 50 tons per year and where such piles are located within a facility with potential particulate emissions from all sources exceeding 100 tons per year, shall be protected by a cover or sprayed with surfactant solution or water on a regular basis, as needed, or treated by an equivalent method, in accordance with the operating program required by paragraph (vi) of this subdivision. This paragraph shall not apply to a specific storage pile if the owner or operator of that pile demonstrates to the commission that fugitive dust from that pile does not cross the property line either by direct wind action or reentrainment.

(ii) All conveyor loading operations to storage piles specified in paragraph (i) of this subdivision shall utilize spray systems, telescopic chutes, stone ladders, or other equivalent methods in accordance with the

operating program required by paragraph (vi) of this subdivision. Unloading operations from storage piles specified in paragraph (i) of this subdivision shall utilize rake reclaimers, bucket wheel reclaimers, under-pile conveying, pneumatic conveying with baghouse, water sprays, gravity-feed plow reclaimer, front-end loaders with limited drop heights, or other equivalent methods in accordance with the operating program required by paragraph (vi) of this subdivision.

(iii) All normal traffic pattern access areas surrounding storage piles specified in paragraph (i) of this subdivision and all normal traffic pattern roads and parking facilities shall be paved or treated with water, oils, or chemical dust suppressants. All paved areas shall be cleaned on a regular basis. All areas treated with water, oils, or chemical dust suppressants shall have the treatment applied on a regular basis, as needed, in accordance with the operating program required by paragraph (vi) of this subdivision.

(iv) All unloading and transporting operations of materials collected by pollution control equipment shall be enclosed or shall utilize spraying, pelletizing, screw conveying, or other equivalent methods.

(v) Crushers, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyor bagging operations, storage bins, and fine product truck and railcar loading operations shall be sprayed with water or a surfactant solution, utilize choke-feeding, or be treated by an equivalent method in accordance with an operating program required under paragraph (vi) of this subdivision. This paragraph shall not apply to high-lines at steel mills. As used in this rule, "fine product" means materials which will pass through a 20-mesh screen or those particles with aerodynamic diameters of 830 microns or less.

(vi) The sources described in this subdivision shall be operated to comply with the provisions of an operating program prepared by the owner or operator and submitted to the commission within 90 days after the effective date of this rule. Such operating program will be designed to significantly reduce fugitive dust and shall reduce the fugitive dust emissions to a level that a particular source is capable of achieving by the application of control technology that is reasonably available, considering technological and economic

feasibility. The operating program shall be implemented upon approval. The operating program is subject to review and approval or disapproval by the commission and shall be considered approved if not acted on by the commission within 90 days of submittal. At a minimum, the operating program shall include all of the following:

(A) The name and address of the facility.

(B) The name and address of the owner or operator responsible for implementation of the operating program.

(C) A map or diagram of the facility showing all of the following:

(1) Approximate locations of storage piles.

(2) Conveyor loading operations.

(3) Normal traffic access areas surrounding storage piles.

(4) All normal traffic patterns within the facility.

(D) The location of unloading and transporting operations with pollution control equipment.

(E) A detailed description of best management practices utilized to achieve compliance with this rule, including an engineering specification of particulate collection equipment, application systems for water, oil, chemicals, and dust suppressants utilized and equivalent methods utilized.

(F) Estimated frequency of application of dust suppressants by location of materials.

(G) Such other information as may be necessary to facilitate the commission's review of the operating program.

The operating program shall be amended from time to time by the owner or operator so that the operating program is current. Such amendment shall be consistent with this rule and shall be submitted to the commission for its review and approval or disapproval.

(b) If particulate collection equipment is operated pursuant to this rule, emissions from such equipment shall not exceed 0.03 grains per dry standard cubic foot (0.07 grams per cubic meter).

(c) The provisions of subrule (1) of this rule shall not apply, and the spraying requirements pursuant to subdivision (a) of this subrule shall not be required, when the wind speed is more than 25 miles per hour (40.2 kilometers per hour). Determination of wind speed for the purposes of this rule shall be by a 1-hour average of hourly recorded value at the nearest official station of the United States weather bureau or by wind speed instruments oper-

ated on the site. In cases where the duration of operations subject to this rule is less than 1 hour, wind speed may be averaged over the duration of the operations on the basis of on-site wind speed instrument measurements.

(d) A person shall not cause or allow the operation of a vehicle for the transporting of bulk materials with a silt content of more than 1% without employing 1 or more of the following control methods:

(i) The use of completely enclosed trucks, tarps, or other covers for bulk materials with a silt content of 20% or more by weight.

(ii) The use of tarps, chemical dust suppressants, or water in sufficient quantity to maintain the surface in a wet condition for bulk materials with a silt content of more than 5% but less than 20%.

(iii) Loading trucks so that no part of the load making contact with any sideboard, side panel, or rear part of the load comes within 6 inches of the top part of the enclosure for bulk materials with a silt content of more than 1% but not more than 5%.

(e) As used in this rule, "silt content" means that portion, by weight, of a particulate material which will pass through a number 200 (75 micron) wire sieve as determined by the American society of testing material, test C-136-76, or other commission-approved method.

(f) All vehicles for transporting bulk materials off-site shall be maintained in such a way as to prevent leakage or spillage and shall comply with the requirements of section 720 of Act No. 300 of the Public Acts of 1949, as amended, being §257.720 of the Michigan Compiled Laws and R 28.1457.

(g) The provisions of subdivisions (d) and (f) of this subrule do not apply to vehicles with less than a 2-ton capacity that are used to transport sand, gravel, stones, peat, and topsoil.

(h) The provisions of paragraphs (i) and (ii) of subdivision (d) of this subrule do not apply where the material has been thoroughly wetted and has the property of forming a stable crust upon drying.

(i) The provisions of subdivisions (d) and (f) of this subrule shall not apply to the transportation, in vehicles which do not leave the facility, of material with a temperature which makes it unreasonable to cover the material.

(3) As used in this rule, "potential particulate emissions" means those emissions of particulate matter expected to occur without control equipment, unless such

control equipment is, aside from air pollution control requirements, vital to the production of the normal product of the source or to its normal operation. Annual potential particulate emissions shall be based on the maximum annual-rated capacity of the source, unless the source is subject to enforceable permit conditions or enforceable orders which limit the operating rate or the hours of operation or both. Enforceable agreements or permit conditions on the type or amount of materials combusted or processed shall be used in determining the potential particulate emission rate of a source.

PART 4. EMISSION LIMITATIONS AND PROHIBITIONS — SULFUR-BEARING COMPOUNDS

R 336.1401. Emission of sulfur dioxide from power plants.

Rule 401. (1) In a power plant, it is unlawful for a person to burn fuel that does not comply with the sulfur content limitation of table 41 or which, when burned, results in sulfur dioxide emissions exceeding an equivalent emission rate as shown in table 42, unless the following conditions are met:

(a) The source of fuel burning is not subject to federal emission standards for new stationary sources.

(b) An installation permit, if required by part 2, was approved by the commission before August 17, 1971.

(c) The user furnishes evidence that the fuel burning does not create or contribute to an ambient level of sulfur dioxide in excess of the applicable ambient air quality standards. The evidence shall consist of air quality data or stack dispersion calculations, or both, satisfactory to the commission.

(d) The user is operating in compliance with a voluntary agreement, order, stipulation, or variance from the commission.

(2) Notwithstanding the provisions of subrule (1), an exception from the limitations of table 41 shall not be permitted after January 1, 1980, unless specific authorization is granted by the commission.

(3) A person responsible for operation of a source that, on the effective date of the 1973 amendment to this rule or for any anticipated time in the future, is or will be using fuel with a sulfur content in excess of that allowed to be burned on July 1, 1978 as listed in table 41, or which, on such effective date or any anticipated time in

the future, is or will be emitting sulfur dioxide in excess of the equivalent emission for that fuel, as shown in table 42, shall submit to the commission a written program for compliance with this rule within 60 days after such effective date. This requirement does not apply to a source for which the commission has approved an exception to table 41 under the provisions of subrule (1).

(4) The program required by subrule (3) shall include the method by which compliance shall be achieved, a complete description of new equipment to be installed or modifications to existing equipment to be made, and a timetable which specifies, at a minimum, the following dates:

- (a) The date equipment shall be ordered.
- (b) The date construction or modification of equipment shall begin.

(c) The date initial start-up of equipment shall begin.

(d) The date emissions shall be reduced to levels shown in tables 41 and 42.

(5) The commission may allow any source that is required to submit a compliance program under subrule (3) an extension to the programmed compliance date, if the following conditions are met:

(a) The source of fuel burning is not subject to federal emission standards for new stationary sources.

(b) An installation permit, if required by part 2, was approved by the commission before August 17, 1971.

(c) The user furnishes satisfactory evidence to the commission that the fuel burning does not create or contribute to an ambient level of sulfur dioxide in excess of the applicable ambient air quality standards.

(6) A person shall not cause or permit the burning of fuel in any fuel-burning equipment that results in an average emission of sulfur dioxide for any calendar month at a rate greater than was emitted by that fuel-burning equipment for the corresponding calendar month of the year 1970, unless otherwise authorized by the commission.

(7) The use of fuels having sulfur contents as set forth in this rule shall not allow degradation in the mass rate of particulate emission, unless otherwise authorized by the commission. The commission may require source emission tests which may be performed by, or under the supervision of, the commission at the expense of the owners and may require the submission of reports to the commission both before and after changes are made in the sulfur content in fuel.

TABLE 41

Sulfur in fuel limitations for fuel-burning equipment

Plant capacity ^(a) 1000 lbs. Steam per hour	Maximum sulfur content in fuel ^(b) Percent by weight ^(c)	
	July 1, 1975	July 1, 1978
0-500	2.0	1.5
Over 500	1.5	1.0

TABLE 42. Equivalent emission rates

% Sulfur in fuels ^(c)	Parts per million by volume Corrected to 50% excess air		Pounds of sulfur dioxide per Million Btu of heat input	
	Solid fuel ^(d) (12,000 Btu/lb)	Liquid fuel ^(e) (18,000 Btu/lb)	Solid fuel ^(d) (12,000 Btu/lb)	Liquid fuel ^(e) (18,000 Btu/lb)
1.0	590	420	1.67	1.11
1.5	890	630	2.50	1.67
2.0	1180	840	3.33	2.22

(a) For the purpose of this rule, "plant capacity" is defined as the total steam production capacity of all coal- and oil-burning equipment in a power plant as of August 17, 1971. A "power plant" is defined as a single structure devoted to steam or electric generation, or both, and may contain multiple boilers.

(b) "Maximum sulfur content in fuel" is defined as the average sulfur content in all fuels burned at any one time in a power plant. The sulfur content shall be calculated on the basis of 12,000 Btu per pound for solid fuels and 18,000 Btu per pound for liquid fuels.

(c) The determination of sulfur content (percent by weight) of fuel shall be carried out in accordance with a procedure acceptable to the commission.

(d) Solid fuels include both pulverized coal and all other coal.

(e) Liquid fuels include distillate oil (No. 1 and No. 2), heavy oil (No. 4, No. 5, and No. 6), and crude oil.

U.S. DEPARTMENT OF JUSTICE

OFFICE OF THE ATTORNEY GENERAL

WASHINGTON, D.C. 20530

MEMORANDUM FOR THE ATTORNEY GENERAL

DATE: 10/10/1961

TO: THE ATTORNEY GENERAL

FROM: [Name]

SUBJECT: [Subject]

1. [Text]

2. [Text]

3. [Text]

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19. [Text]

20. [Text]

1. The first step in the process of the investigation is the identification of the problem. This is done by the investigator who is assigned to the case. The investigator must first determine the nature of the problem and the scope of the investigation. This is done by interviewing the complainant and the witnesses, and by reviewing the evidence. The investigator must also determine the objectives of the investigation and the methods to be used.

2. The second step is the collection of evidence. This is done by the investigator who is assigned to the case. The investigator must first determine the nature of the problem and the scope of the investigation. This is done by interviewing the complainant and the witnesses, and by reviewing the evidence. The investigator must also determine the objectives of the investigation and the methods to be used.

3. The third step is the analysis of the evidence. This is done by the investigator who is assigned to the case. The investigator must first determine the nature of the problem and the scope of the investigation. This is done by interviewing the complainant and the witnesses, and by reviewing the evidence. The investigator must also determine the objectives of the investigation and the methods to be used.

4. The fourth step is the preparation of the report. This is done by the investigator who is assigned to the case. The investigator must first determine the nature of the problem and the scope of the investigation. This is done by interviewing the complainant and the witnesses, and by reviewing the evidence. The investigator must also determine the objectives of the investigation and the methods to be used.

5. The fifth step is the presentation of the report. This is done by the investigator who is assigned to the case. The investigator must first determine the nature of the problem and the scope of the investigation. This is done by interviewing the complainant and the witnesses, and by reviewing the evidence. The investigator must also determine the objectives of the investigation and the methods to be used.

only one person

of the collected data is the same as the data collected in the field. For purposes of comparison to the data collected in the field, the data collected in the laboratory is the same as the data collected in the field.

For the purpose of this study, the data collected in the laboratory is the same as the data collected in the field.

For the purpose of this study, the data collected in the laboratory is the same as the data collected in the field.

data were collected on a weekly basis.

(d) Comparison with the appropriate control group will be made.

(e) The results of the study will be reported in a separate report.

(f) The results of the study will be reported in a separate report.

(g) The results of the study will be reported in a separate report.

(h) The results of the study will be reported in a separate report.

(i) The results of the study will be reported in a separate report.

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(ak) The results of the study will be reported in a separate report.

Final Rules

satisfying any resulting penalty. A person who receives transfer of a permit is also liable for abatement and for any penalty attributable to the period following transfer. However, the division director may, in writing, waive any penalty that would otherwise apply during a period of not more than ninety (90) days following the transfer, if the division director determines that the new permit holder is acting in good faith to correct the violation.

(e) No transfer of a permit issued for oil and gas purposes is effective until the transfer is approved in writing by the division director. (*Department of Natural Resources; Oil and Gas Operations Rule No 36; filed Aug 4, 1958, 1:00 p.m.; Rules and Regs. 1959, p. 34; filed Jul 17, 1984, 9:14 a.m.; 7 IR 2515; filed Oct 31, 1988, 9:06 a.m.; 12 IR 543; filed Dec 6, 1990, 12:00 p.m.; 14 IR 588; filed May 17, 1993, 5:00 p.m.; 16 IR 2362*)

LSA Document #92-170(F)

Proposed Rule Published: October 1, 1992; 16 IR 100

Hearings Held: October 26, 1992 and October 27, 1992

Approved by Attorney General: April 29, 1993

Approved by Governor: May 14, 1993

Filed with Secretary of State: May 17, 1993, 5:00 p.m.

Incorporated Documents Filed with Secretary of State: None

TITLE 326 AIR POLLUTION CONTROL BOARD

LSA Document #92-163(F)

DIGEST

Amends 326 IAC 1-2 to add definitions for PM₁₀ rules. Amends 326 IAC 5-1 to add general and specific requirements. Adds 326 IAC 6-1-10.1 to establish PM₁₀ emission limitations. Adds 326 IAC 6-1-10.2 to establish emission limitations and other requirements for coke batteries. Adds 326 IAC 6-1-11.1 to establish requirements for the submittal of control plans for selected sources in Lake County. Amends 326 IAC 11-3-2 to include emission limits. Amends 326 IAC 11-3-4 to establish new compliance determination procedures for oven door emissions in Lake County. Repeals 326 IAC 5-1-6, 326 IAC 6-1-10, and 326 IAC 6-1-11. Effective 30 days after filing with the secretary of state.

326 IAC 1-2-32.1

326 IAC 1-2-34.1

326 IAC 1-2-62.1

326 IAC 1-2-63.1

326 IAC 1-2-63.2

326 IAC 5-1-1

326 IAC 5-1-2

326 IAC 5-1-3

326 IAC 5-1-4

326 IAC 5-1-5

326 IAC 5-1-6

326 IAC 5-1-7

326 IAC 6-1-10

326 IAC 6-1-10.1

326 IAC 6-1-10.2

326 IAC 6-1-11

326 IAC 6-1-11.1

326 IAC 11-3-2

326 IAC 11-3-4

SECTION 1. 326 IAC 1-2-32.1 IS ADDED TO READ AS FOLLOWS:

326 IAC 1-2-32.1 "Gooseneck cap" definition

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1-2; IC 13-7-1

Sec. 32.1. "Gooseneck cap" means a device which is located between the damper valve and the coke oven on the standpipe. When open, it vents the coke oven to the atmosphere. (*Air Pollution Control Board; 326 IAC 1-2-32.1; filed May 12, 1993, 11:30 a.m.; 16 IR 2363*)

SECTION 2. 326 IAC 1-2-34.1 IS ADDED TO READ AS FOLLOWS:

326 IAC 1-2-34.1 "Jumper pipe" definition

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1-2; IC 13-7-1

Sec. 34.1. "Jumper pipe" means a section of U-shaped pipe which is positioned on the top of an oven opposite to the side having the collector main. The pipe is used during the charging operation to vent the visible emissions, particulate matter, and gases generated from the oven being charged to an adjacent oven. (*Air Pollution Control Board; 326 IAC 1-2-34.1; filed May 12, 1993, 11:30 a.m.; 16 IR 2363*)

SECTION 3. 326 IAC 1-2-62.1 IS ADDED TO READ AS FOLLOWS:

326 IAC 1-2-62.1 "Quench car" definition

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1-2; IC 13-7-1

Sec. 62.1. "Quench car" means movable car on rails that is self-propelled or propelled by a locomotive and designed to receive the charge of hot coke pushed from an oven of a coke battery. The quench car transports the coke to a quench tower for quenching and is designed to allow the water which does not evaporate to drain into a sump. (*Air Pollution Control Board; 326 IAC 1-2-62.1; filed May 12, 1993, 11:30 a.m.; 16 IR 2363*)

SECTION 4. 326 IAC 1-2-63.1 IS ADDED TO READ AS FOLLOWS:

326 IAC 1-2-63.1 "Quench reservoir" definition

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1-2; IC 13-7-1

Sec. 63.1. "Quench reservoir" means a tank, usually located near the top of a quench tower, that holds sufficient water to quench the hot coke carried by the quench car. (*Air Pollution Control Board; 326 IAC 1-2-63.1; filed May 12, 1993, 11:30 a.m.; 16 IR 2363*)

Final Rules

SECTION 5. 326 IAC 1-2-63.2 IS ADDED TO READ AS FOLLOWS:

326 IAC 1-2-63.2 "Quench tower" definition

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1-2; IC 13-7-1

Sec. 63.2. "Quench tower" means a chimney-like structure equipped with a water spray system and a sump to catch the excess water. The tower is designed to accommodate a quench car which is positioned under the tower prior to a quench. During the quenching of coke, the water flows from the quench reservoir into the nozzles by gravity and is dispersed onto the hot coke held by the quench car. (Air Pollution Control Board; 326 IAC 1-2-63.2; filed May 12, 1993, 11:30 a.m.: 16 IR 2364)

SECTION 6. 326 IAC 5-1-1 IS AMENDED TO READ AS FOLLOWS:

326 IAC 5-1-1 Applicability of rule

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1

Sec. 1. (a) This rule (326 IAC 5-1-1) shall apply to all visible emissions, not including condensed water vapor, emitted by or from any a facility or source. ~~except these sources or~~ This rule shall not apply to facilities for which specific visible emission limitations have been established by in 326 IAC 11, 326 IAC 12, or 326 IAC 6.

(1) (b) The requirements of 326 IAC 5-1-2(e)(1) section 2(1) of this rule shall apply to sources or facilities located in attainment areas for particulate matter designated in 326 IAC 1-4.

(2) (c) The requirements of 326 IAC 5-1-2(e)(2) section 2(2) of this rule shall apply to sources or facilities located in nonattainment the following areas: for particulate matter as designated in 326 IAC 1-4.

- (1) Clark County—Jeffersonville Township.
- (2) Dearborn County—Lawrenceburg Township.
- (3) Dubois County—Bainbridge Township.
- (4) Lake County—An area bounded on the north by Lake Michigan, on the west by the Indiana-Illinois state line, on the south by U.S. 30 from the state line to the intersection of I-65 to the intersection of I-94 then following I-94 to the Lake-Porter county line, and on the east by the Lake-Porter county line.
- (5) Marion County except the area of Washington Township east of Fall Creek and the area of Franklin Township south of Thompson Road and east of Five Points Road.
- (6) St. Joseph County—The area north of Kern Road and east of Pine Road.
- (7) Vanderburgh County—The area included in the city

of Evansville and Pigeon Township.

(8) Vigo County—The area within a 0.5 kilometers radius circle centered at UTM Coordinates Zone 16 East 464.52 km North 4369.21 km.
(Air Pollution Control Board; 326 IAC 5-1-1; filed Mar 10, 1988, 1:20 p.m.: 11 IR 2421; filed May 12, 1993, 11:30 a.m.: 16 IR 2364)

SECTION 7. 326 IAC 5-1-2 IS AMENDED TO READ AS FOLLOWS:

326 IAC 5-1-2 Visible emission limitations

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1

Sec. 2. (a) Visible emissions from any a source or facility shall not exceed any of the following limitations, and unless otherwise stated, all visible emissions shall be observed in accordance with the procedures set forth in 326 IAC 5-1-4, section 4 of this rule:

(1) Sources or facilities of visible emissions located in attainment areas for particulate matter shall meet the following limitations:

(A) Visible emissions shall not exceed an average of forty percent (40%) opacity in twenty-four (24) consecutive readings.

(B) Visible emissions shall not exceed sixty percent (60%) opacity for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) in a six (6) hour period.

(2) Sources or facilities of visible emissions located in nonattainment the areas listed in section 1(c) of this rule shall meet the following limitations:

(A) Visible emissions shall not exceed an average of thirty percent (30%) opacity in twenty-four (24) consecutive readings.

(B) Visible emissions from a facility located in Lake County shall not exceed an average of twenty percent (20%) opacity in twenty-four (24) consecutive readings unless otherwise specified in 326 IAC 6-1-10.1. This visible emission limit shall supercede [sic.] the visible emissions limit contained in clause (A).

(C) Visible emissions shall not exceed sixty percent (60%) opacity for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) in a six (6) hour period.

(3) Sources and facilities of visible emissions located in both attainment or nonattainment areas, for which an alternate visible emission limitation has been established pursuant to 326 IAC 5-1-5(b), under section 5(b) of this rule, shall comply with said the limitations in lieu of the limitations set forth in subsection (a)(1) and (a)(2) of this section 5(b) of this rule instead of the limitations in subdivisions (1) and (2).

(Air Pollution Control Board; 326 IAC 5-1-2; filed Mar 10,

1988, 1:20 p.m.: 11 IR 2421; filed May 12, 1993, 11:30 a.m.: 16 IR 2364)

SECTION 8. 326 IAC 5-1-3 IS AMENDED TO READ AS FOLLOWS:

326 IAC 5-1-3 Temporary exemptions

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1

Sec. 3. (a) **Boiler startup and shutdown:** When building a new fire in a boiler, or shutting down a boiler, visible emissions may exceed the applicable opacity limit established in 326 IAC 5-1-2(e), section 2 of this rule; however, visible emissions shall not exceed an average of sixty percent (60%) opacity. and Visible emissions in excess of the applicable opacity limit established in section 2 of this rule shall not continue for more than ten (10) twelve (12) continuous minutes on one (1) occasion in any twenty-four (24) hour period.

(b) **Cleaning boilers:** When removing ashes from the fuel bed or furnace in a boiler or blowing tubes, visible emissions may exceed the applicable opacity limit established in 326 IAC 5-1-2(e) section 2 of this rule; however, visible emissions shall not exceed sixty percent (60%) opacity and visible emissions in excess of the applicable opacity limit shall not continue for more than five (5) six (6) continuous minutes on one (1) occasion in any a sixty (60) minute period. Such The visible emissions shall not be permitted on more than three (3) occasions in any a twelve (12) hour period.

(c) Facilities not temporarily exempted by subsections (a) and (b), of this section and not located in Lake County, may be granted special temporary exemptions by the commissioner of the same duration and type authorized therein in subsections (a) and (b) provided that the facility proves to the satisfaction of the commissioner that said the exemptions are needed and that during periods of startup and shutdown, owners and operators shall, to the extent practicable, maintain and operate any an affected facility including air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available provided to the commissioner upon request, which may include, but is not limited to, the following:

- (1) Monitoring results.
- (2) Opacity observations.
- (3) Review of operating and maintenance procedures. and
- (4) Inspection of the source.

(d) Sources or facilities not exempted through subsections (a), (b), or (c) of this section may also be granted special exemptions by the commissioner, provided that the source or

facility owner or operator proves to the satisfaction of the commissioner that said exemption is justifiable. Said exemption(s) may be of longer duration and may apply to other types of facilities not provided for in subsections (a) or (b) of this section. The commissioner may require a source to install a certified opacity emissions monitor, where technically feasible, operate the certified opacity emissions monitor in accordance with procedures specified in 326 IAC 3, and maintain other records needed to verify compliance with the temporary exemption. (Air Pollution Control Board; 326 IAC 5-1-3; filed Mar 10, 1988, 1:20 p.m.: 11 IR 2422; filed May 12, 1993, 11:30 a.m.: 16 IR 2365)

SECTION 9. 326 IAC 5-1-4 IS AMENDED TO READ AS FOLLOWS:

326 IAC 5-1-4 Compliance determination

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1

Sec. 4. (a) Determination of visible emissions from sources or facilities to which this rule (326 IAC 5-1) applies may shall be made in accordance with subdivisions subdivision (1) or (2) below as follows:

(1) Determination of visible emissions by means of a qualified observer shall be made according to the following:

(A) **Position:** The qualified observer shall stand at a distance sufficient to provide a clear view of the emissions with the sun, if visible, oriented in the one hundred forty degree (140°) sector to his back. Consistent with maintaining the above requirement in this clause the observer shall, as much as possible, make his observations from a position such that his line of vision is approximately perpendicular to the direction of the visible emissions or plume, where applicable, and when observing opacity of emissions from rectangular outlets (e.g., for example, monitors, open baghouses, noncircular stacks, approximately perpendicular to the longer axis of the outlet. The observer's line of sight should shall not include more than one (1) plume at a time when multiple stacks are involved, and in any case the observer should shall make his observations with his line of sight perpendicular to the longer axis of such set of multiple stacks, (e.g., for example, stub stacks or baghouses.

(B) **Field records:** The observer shall record the name of the plant, emission location, type of facility, observer's name and affiliation, and the date on a field data sheet. Time, estimated distance to the emission location, approximate wind direction, estimated wind speed, description of the sky conditions (presence and color of clouds), and visible emissions or plume where applicable background are shall be recorded on a field data sheet at the time opacity readings are initiated and completed.

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(C) **Observations:** Opacity observations shall be made at the point of greatest opacity in that portion of the visible emissions or plume where applicable where condensed water vapor is not present. The observer shall not look continuously at the visible emissions or plume where applicable; but instead shall observe the visible emissions or plume where applicable, momentarily at fifteen (15) second intervals.

(D) **Recording observations:** Opacity observations shall be recorded to the nearest five percent (5%) at fifteen (15) second intervals on an observational record sheet. A minimum of twenty-four (24) observations shall be recorded. Each momentary observation shall be deemed to represent the average opacity of emissions for a fifteen (15) second period.

(E) **Determination of opacity as an average of twenty-four (24) consecutive observations:** Opacity shall be determined as an average of twenty-four (24) consecutive observations recorded at fifteen (15) second intervals. Readings preceding and following missed readings shall be considered consecutive. Divide the observations recorded on the record sheet into sets of twenty-four (24) consecutive observations. A set is composed of any twenty-four (24) consecutive observations. Sets need not be consecutive in time and in no case shall two (2) sets overlap. For each set of twenty-four (24) observations, calculate the average by summing the opacity of the twenty-four (24) observations and dividing this sum by twenty-four (24). Record the average opacity on a record sheet. For the purpose of determining an alternative visible emission limit in accordance with 326 IAC 5-1-5(b) following, section 5(b) of this rule, an average of twenty-four (24) consecutive readings or more may be used to calculate the alternate visible emissions limit.

(F) **Determination of opacity as a cumulative total of fifteen (15) minutes:** For emissions from intermittent sources, opacity shall be determined in accordance with clause clauses (A) (B), through (C) and the first sentence of clause (D). Each momentary observation shall be deemed to represent the average opacity of emissions for a fifteen (15) second period. All readings greater than the specified limit in 326 IAC 5-1-3 section 2 of this rule shall be accumulated as fifteen (15) second segments for comparison with the limit.

(G) **Attached steam plumes:** When condensed water vapor is present within the plume as it emerges from the emission outlet, opacity observations shall be made beyond the point in the plume at which condensed water vapor is no longer visible. The observer shall record the approximate distance from the emission outlet to the point in the plume at which the observations are made.

(H) **Detached steam plumes:** When water vapor in the plume condenses and becomes visible at a distinct

distance from the emission outlet, the opacity of emissions should shall be evaluated at the emission outlet prior to the condensation of water vapor and the formation of the steam plume.

(2) For a source or facility in compliance with the requirements of 326 IAC 3-1.1, determination of compliance with visible emission limitations established in this rule (326 IAC 5-1) may also be made in accordance with a source's or facility's continuous monitoring equipment for any source or facility in compliance with the requirements of 326 IAC 3-1, if determined appropriate by the department or the U.S. EPA.

(b) If the compliance determination procedures set forth in subsections (a)(1) and (a)(2) of this section results subsection (a) result in any a conflict in visible emission readings, the determination made in accordance with subsection (a)(2) of this section shall prevail for the purpose of compliance, provided that it can be shown that the opacity continuous emissions monitor has not meets the performance specifications as set forth in the 40 CFR 60, specifically Performance Specification 1. (*Air Pollution Control Board; 326 IAC 5-1-4; filed Mar 10, 1988, 1:20 p.m.; 11 IR 2422; filed May 12, 1993, 11:30 a.m.; 16 IR 2365*)

SECTION 10. 326 IAC 5-1-5 IS AMENDED TO READ AS FOLLOWS:

326 IAC 5-1-5 Violations

Authority: IC 13-1-4; IC 13-7-7

Affected: IC 13-1-1

Sec. 5. (a) A violation of this rule (326 IAC 5-1) shall constitute prima facie evidence of a violation of other the applicable particulate mass emission control regulations, limitation. A violation of any such the mass emission rule may be refuted by a performance test conducted in accordance with subsection (b). of this section. Such The test shall refute the mass emission violation only if the source is shown to be in compliance with the allowable mass emission limit. An exceedance of the allowable opacity emission limit during a performance test will not be treated as a violation of the applicable mass emission limitation if, during the test described in subsection (b), of this section, the source demonstrates compliance with the allowable mass emission limit while simultaneously having visible emissions more than or equal to the reading at which the exceedance was originally observed.

(b) The owner or operator of If a source or facility which believes it can operate in compliance with the applicable mass emission limitation, but exceeds the limits specified in 326 IAC 5-1-3, section 2 of this rule, the owner or operator may submit a written petition to the commissioner requesting that an alternate opacity limitation be established. pursuant to the following provisions: Additionally, if the commissioner has

issued a notice of violation to an owner or operator of a source or facility for violation of the applicable opacity limitation, such owner or operator may prepare in notice of violation resolution to disprove said violation by establishing an alternate opacity limit pursuant to the following provisions. This alternate limit shall be based upon both a mass emission performance test conducted according to a method designated by the commissioner, procedures specified in 326 IAC 3 and a visible emission test conducted simultaneously, according to 326 IAC 3-1-4, section 4 of this rule. Demonstration that the facility is in compliance with the applicable mass emission limit is a requirement prior to establishing an alternate opacity limit. Where the commissioner determines there is no acceptable test method available, a request for an alternate visible emission limit shall be denied.

(4) The alternate emission limit shall be equal to that level of opacity at which the source or facility will be able to meet the standard by the performance and opacity tests to meet the opacity standard at all times during which the source or facility is meeting the mass emission limitation. However, the commissioner shall also reserve the right to determine the alternate visible emissions limit in the following manner:

(A) If a performance test of a source or facility demonstrates:

(i) that said source or facility is in compliance with the allowable mass emissions limit (as defined in 326 IAC 3-2) at the time that the test is done; and

(ii) simultaneously, said source's or facility's test demonstrates that the allowable opacity emission limit is being exceeded; then, the enforceable opacity limitation shall be equal to that level of opacity at which the source or facility will be able to meet the standard by the performance and opacity tests to meet the opacity standard at all times during which the source or facility is meeting the mass emission limitation.

(B) If a performance test of a source or facility demonstrates:

(i) that said source or facility is in compliance with the allowable mass emission limit, and the test mass emission rate is within ten percent (10%) of the allowable emissions limit for that source or facility; and

(ii) simultaneously, said source's or facility's test demonstrates that the opacity observed is below the allowable opacity emission limit, the enforceable opacity limitation shall be equal to that level of opacity at which the source or facility will be able to meet the standard by the performance and opacity tests, to meet the opacity standard at all times during which the source or facility is meeting the mass emission limitation.

(C) If a performance test of a source or facility demonstrates:

(i) that said source or facility is in compliance with the allowable mass emission limit, and the test mass emission rate is less than ninety percent (90%) of the allowable emissions limit; and

(ii) simultaneously, said source's or facility's test demonstrates that the opacity observed is below the allowable opacity emission limit, the enforceable opacity limitation shall remain the existing allowable opacity emission limitation for that source or facility.

As a condition of approving an alternative opacity limit, the commissioner may require a source to install a continuous opacity emissions monitor, operate the continuous opacity emissions monitor in accordance with procedures specified in 326 IAC 3, and maintain other records needed to verify compliance with the temporary exemption alternative opacity limits. The commissioner may also establish an alternative opacity limit different from the limit that the source requested in the petition. However, in that case, the limit established by the commissioner shall be equal to the lowest opacity that can be continuously achieved at the mass emission level achieved in the performance test.

(2) (1) Compliance with 326 IAC 6-1, 326 IAC 6-2, 326 IAC 6-3, and 326 IAC 11-1, and other applicable rules must shall be demonstrated by the performance test.

(2) The commissioner may require a performance test in any case where it is necessary to determine the compliance status for a facility. However, the commissioner will not request a performance test for any facility which is known to be in compliance with the allowable opacity limitation.

(4) All (2) An alternate visible emission limits limit shall be established on a source or facility specific basis. No limitation for any a facility or source shall be established by reference referring to a similar or identical facility or source.

(5) The owner or operator of the source or facility shall notify the commissioner at least fifteen (15) days prior to conducting a test for the purposes of demonstrating an alternate visible emission limit.

(6) A staff member who is a qualified observer, approved by the commissioner or other consultant approved by the commissioner shall be present during any performance test.

(7) The test of the performance test shall be at the expense of the owner or operator.

(8) Any (3) An alternate visible emission limit established for any a source or facility shall not become effective until said limitation is established in the applicable operating permit. Said limitation will be incorporated, by amendment, into the operating permit for said the source or facility after a public comment period and submitted to the U.S. EPA as a SIP revision. The limitation shall not become effective until approved as a SIP revision by the U.S. EPA.

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(9) (4) Where a visible emission limitation is based upon a new source performance standard, any a new limitation must shall comply with the provisions of said the standard. Nothing in this rule shall be construed as allowing an exception or exemption from a requirement in a state or federal new source performance standard without approval as a SIP revision by the U.S. EPA.

(Air Pollution Control Board; 326 IAC 5-1-5; filed Mar 10, 1988, 1:20 p.m.: 11 IR 2423; filed May 12, 1993, 11:30 a.m.: 16 IR 2366)

SECTION 11. 326 IAC 5-1-7 IS AMENDED TO READ AS FOLLOWS:

326 IAC 5-1-7 State implementation plan revisions

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1

Sec. 7. Any Exemptions given or provisions granted to this rule (326 IAC 5-1) by the commissioner under 326 IAC 5-1-3(a), 326 IAC 5-1-3(d), or 326 IAC 5-1-5(b), section 3(c) and 3(d) or section 5(b) of this rule shall be submitted to the U.S. EPA as a SIP revision and shall not become effective until approved as a SIP revision by the U.S. EPA. (Air Pollution Control Board; 326 IAC 5-1-7; filed Mar 10, 1988, 1:20 p.m.: 11 IR 2423; filed May 12, 1993, 11:30 a.m.: 16 IR 2368)

SECTION 12. 326 IAC 6-1-10.1 IS ADDED TO READ AS FOLLOWS:

326 IAC 6-1-10.1 Lake County PM₁₀ emission requirements

Authority: IC 13-1-1-4; IC 13-7-7

Affected: IC 13-1-1; IC 13-7

Source

A. METZ

Asphalt batch plant

ADVANCED ALUMINUM PRODUCTS

Reverberatory furnace number 1

Reverberatory furnace number 2

Reverberatory furnace number 3

Reverberatory furnace number 4

Reverberatory furnace number 5

AMERICAN CAN

Stack serving incinerators (3 units)

Coil coater

AMERICAN MAIZE PRODUCTS (AMAIZO)

Number 93 warehouse central vacuum cleaning system

First stage germ dryer exhaust

Second stage germ dryer exhaust

Activated carbon regenerating furnace

Stack serving boiler numbers 6 and 7

Stack serving boiler numbers 8 and 10

Bulk carbon/bulk filter aid system

Each stack serving bulk corn starch storage bin numbers 20 through 36

Sec. 10.1. (a) The provisions of this section shall apply to the sources, facilities, and operations listed in subsection (d).

(b) The following definitions apply throughout this section:

(1) "lbs/hr" means pounds of particulate matter emissions emitted per one (1) sixty (60) minute period.

(2) "lbs/MMBtu" means pounds of particulate matter emissions per million British thermal units heat input of fuels fired in the source, unless otherwise stated.

(3) "lbs/ton" means pounds of particulate matter emissions per ton of product output from the particular facility, unless otherwise stated. Byproducts which may be sold as product shall not be included under the term "product".

(4) "gr/dscf" means grains of particulate matter per dry standard cubic foot of exhaust air.

(c) All emission limits in this section shall be PM₁₀ limits, unless otherwise stated.

(d) The following sources shall comply with the corresponding PM₁₀ and total suspended particulates (TSP) emission limitations and other requirements in this section consistent with the provisions as applicable in subsection (k). Each emission limit applies to one (1) stack serving one (1) facility unless otherwise noted. The emission limitations apply to one (1) stack serving the multiple units specified when the facility description notes "stack serving", and to each stack of multiple stacks serving multiple facilities when the facility description notes "each stack serving".

Emission Limit Units	Emission Limit (lbs/hr)
0.180 lbs/ton	27.00
0.060 lbs/ton	0.970
0.142 lbs/ton	0.430
0.145 lbs/ton	0.510
0.145 lbs/ton	0.510
0.130 lbs/ton	1.137
0.007 lbs/MMBtu	0.310
0.007 lbs/MMBtu	0.290
2.000 lbs/ton	0.050
0.001 lbs/ton	0.010
0.002 lbs/ton	0.010
0.225 lbs/ton TSP	0.19 TSP
0.102 lbs/MMBtu	32.590
0.102 lbs/MMBtu	24.442
0.080 lbs/ton	1.400
0.012 lbs/ton	0.082

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Equipment conveying corn dirt to dirt storage silo	0.050 lbs/ton	0.205
Corn elevator central vacuum system	0.040 lbs/ton	0.100
Corn elevator dust control system number 1	0.200 lbs/ton	0.085
Corn elevator dust control system number 2	0.200 lbs/ton	0.140
Corn syrup solids conveyor equipment	0.005 lbs/ton	0.020
Starch conveying system number 47	0.018 lbs/ton	0.054
Corn syrup solids dust collection system number 2	0.262 lbs/ton TSP	1.76 TSP
Corn syrup spray dryer number 1 cooler system	0.444 lbs/ton TSP	2.71 TSP
Corn syrup spray dryer number 2 cooler system	0.444 lbs/ton TSP	2.71 TSP
Dextrin bulk loading equipment	0.011 lbs/ton	0.340
Dextrin conveying system number 48	0.018 lbs/ton	0.54
Each stack serving dextrin manufacturing equipment system numbers 1 through 7	0 lbs/ton	0.00
Dried corn syrup conveying system, frodex	0.004 lbs/ton	0.034
Feed cooling system number 2	0.276 lbs/ton	4.37
Feed flash dryer number 1	0.140 lbs/ton	2.82
Feed flash dryer number 2	0.219 lbs/ton	4.42
Feed milling system	0.033 lbs/ton	0.740
Feed pelletizing A	0.010 lbs/ton	0.370
Feed pelletizing B	0.023 lbs/ton	0.855
Feed pelletizing C	0.023 lbs/ton	0.855
Feed pelletizing D	0.017 lbs/ton	0.600
Finished feed conveying equipment	0.091 lbs/ton	2.73
Finished germ conveying equipment	0.251 lbs/ton	0.375
Finished gluten conveying system	0.020 lbs/ton	0.082
Gluten ring dryer scrubber	0.172 lbs/ton TSP	4.72 TSP
New corn syrup spray dryer cooler system number 2	0.847 lbs/ton	3.26 TSP
Stack serving special starch (P.G.) manufacturing equipment system number 4 (2 units)	0.200 lbs/ton	0.400
Receiver for first stage germ dryer	0.008 lbs/ton	0.06
Receiver for second stage germ dryer	0.169 lbs/ton	0.660
Each stack serving heir rotary feed dryer numbers 1 through 5	0.013 lbs/ton	0.698
Special starch (P.G.) manufacturing equipment system number 1	0.050 lbs/ton	0.019
Special starch (P.G.) manufacturing equipment system number 2	1.000 lbs/ton	0.175
Special starch (P.G.) manufacturing equipment system number 3C (1/2 system number 3)	0.400 lbs/ton	0.015
Special starch (P.G.) manufacturing equipment system number 3D (1/2 system number 3)	0.15 lbs/ton	0.015
Stack serving starch bulk loading equipment (point A)	0.02 lbs/ton	0.600
Stack serving starch bulk loading equipment (point B)	0.007 lbs/ton	0.24
Starch conveying system number 46	0.150 lbs/ton	0.540
Starch flash feed dryer number 1 scrubber	0.0 lbs/ton	0.0
Starch milling system number 1	0.5 lbs/ton	0.5
Starch milling system number 2	0.149 lbs/ton	0.5
Starch ring dryer number 2 scrubber	0.742 lbs/ton TSP	10 TSP
Starch ring dryer number 3 scrubber	0.035 lbs/ton TSP	1.12 TSP
Starch vacuum cleanup equipment	2.000 lbs/ton	0.150
Waxy bulk cornstarch storage bins numbers 95 through 98 (only 1 may operate at a time)	0.008 lbs/ton	0.180
Waxy feed conveyor system	0.200 lbs/ton	0.140
Waxy feed drum dryer scrubber	0.115 lbs/ton TSP	11.12 TSP
Waxy feed milling equipment	0.200 lbs/ton	0.140
Waxy germ equipment conveying to cooler building	0.200 lbs/ton	0.600
Starch dryer number 4, building 91	0.35 lbs/ton	3.5 TSP
Dextrin incoming starch, building 46	0.004 lbs/ton	0.024
BCD dryer, building 127	0.227 lbs/ton	0.37
Four products blending systems, building 93	0.020 lbs/ton	0.240

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Stack serving starch packing systems numbers 1 and 2, building 93	0.004 lbs/ton	0.120
Each stack serving bag dump numbers 1 and 2	0.690 lbs/ton	0.190
Sulfate bag dumping	1.520 lbs/ton	0.190
Frodex semibulk packing system, building 93	0.250 lbs/ton	0.150
Dextrin starch cooler, building 34	0.017 lbs/ton	0.100
Dextrin incoming starch, building 34	0.006 lbs/ton	0.095
Dextrin starch reactor, building 34	0.020 lbs/ton	0.110
Dextrin storage hopper, building 34	0.042 lbs/ton	0.250
AMERICAN STEEL—EAST CHICAGO		
Sand kiln and cooler	0.636 lbs/ton	16.29
Sandheater mixing	0.520 lbs/ton	11.44
Electric induction furnaces (2 units)	0.104 lbs/ton	1.248
#2 tumblast with dust collector	0.145 lbs/ton of product	0.678
#3 tumblast with dust collector	0.145 lbs/ton of product	0.678
Shakeout dust collector	0.012 lbs/ton of product	0.384
AMERICAN STEEL FOUNDRY—HAMMOND		
Stack serving coil spring grinder numbers 3-0386 and 3-0389	1.083 lbs/ton	0.045
Stack serving coil spring grinder number 3-0244	0.021 lbs/ton	0.040
Tub grinder number 3-0388	0.015 lbs/ton	2.00
Coil spring grinder number 3-0247	0.019 lbs/ton	0.03
Coil spring grinder number 3-0249	3.792 lbs/ton	1.82
Coil spring grinders numbers 3-0385, 3-295, and 3-0233	0.019 lbs/ton	0.05
Shot blast peener number 3-1804	0.011 lbs/ton	0.06
Shot blast peener number 3-1811	0.018 lbs/ton	0.06
Shot blast peener number 3-1821	0.016 lbs/ton	0.06
Shot blast peener number 3-1823	0.016 lbs/ton	0.06
Small coil manufacturing (ESP number 3-3024)	0.014 lbs/ton	0.02
Medium coil manufacturing (ESP number 3-3027)	0.700 lbs/ton	2.10
Large coil manufacturing (ESP number 3-3028)	0.700 lbs/ton	3.50
Miscellaneous coil manufacturing (ESP number 3-3026)	0.700 lbs/ton	1.05
AMOCO OIL, WHITING REFINERY		
Number 1 CRU, F-101 feed preheater	0.004 lbs/MMBtu	0.267
Stack serving number 1 CRU, F-102, F-201, F-202 heaters	0.004 lbs/MMBtu	0.290
Stack serving number 1 power station, boiler numbers 1, 2, 3, and 4	0.016 lbs/MMBtu	15.809
Stack serving number 1 power station, boiler numbers 5, 6, 7, and 8	0.016 lbs/MMBtu	13.244
Stack serving number 11 pipe still furnaces H-101, H-102, H-103, H-104, coke preheaters	0.004 lbs/MMBtu	0.741
Number 11 pipe still, H-1X heater	0.031 lbs/MMBtu	6.867
Number 11 pipe still, H-2 vacuum heater	0.032 lbs/MMBtu	1.440
Number 11 pipe still, H-200 crude charge	0.032 lbs/MMBtu	7.866
Number 11 pipe still, H-3 vacuum heater	0.031 lbs/MMBtu	1.704
Number 11 pipe still, H-300 furnace	0.031 lbs/MMBtu	4.931
Stack serving number 12 pipe still, H-1A and H-1B preheaters and H-2 vacuum heater	0.025 lbs/MMBtu	16.348
Each stack serving number 12 pipe still, H-1CN and H-1CS crude preheater	0.004 lbs/MMBtu	0.444
Number 12 pipe still, H-1CX crude preheater	0.004 lbs/MMBtu	0.924
Number 2 isomerization, F-7 furnace	0.004 lbs/MMBtu	0.085
Number 2 isomerization, H-1 feed heater furnace	0.004 lbs/MMBtu	0.704
Each stack serving number 3 power station, boiler numbers 1, 2, 3, 4, and 6	0.030 lbs/MMBtu	17.49
Number 3 ultraformer, F-7 furnace	0.004 lbs/MMBtu	0.085
Number 3 ultraformer, H-1 feed heater furnace	0.004 lbs/MMBtu	0.852
Number 3 ultraformer, H-2 feed heater furnace	0.004 lbs/MMBtu	0.685
Number 3 ultraformer, waste heat recovery unit	0.004 lbs/MMBtu	1.537

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Stack serving number 37 pipe still, B-1 feed preheater, B-2 wax fractioner	0.018 lbs/MMBtu	1.903
Stack serving number 4 ultraformer, F-1 ultrafiner furnace F-8A and F-8B reboilers	0.004 lbs/MMBtu	1.459
Number 4 ultraformer, F-2 preheater furnace	0.004 lbs/MMBtu	1.059
Number 4 ultraformer, F-3 number 1 reheat furnace	0.004 lbs/MMBtu	0.896
Stack serving number 4 ultraformer, F-4 number 2 reheat furnace, F-5 number 3 reheat furnace, and F-6 number 4 reheat furnace	0.004 lbs/MMBtu	1.060
Number 4 ultraformer, F-7 furnace	0.004 lbs/MMBtu	0.159
Aromatics recovery unit, F-200A furnace	0.004 lbs/MMBtu	0.924
Aromatics recovery unit, F-200B furnace	0.004 lbs/MMBtu	0.924
Blending oil desulphurization, F-401 furnace	0.004 lbs/MMBtu	0.130
Cat feed hydrotreating unit	0.004 lbs/MMBtu	0.246
F-1 Berry Lake distillate heater	0.004 lbs/MMBtu	0.048
F-2 Steiglitz Park residual heater	0.008 lbs/MMBtu	0.208
Stack serving heavy oils unit, H-101, H-201, H-202	0.004 lbs/MMBtu	0.030
NMP extraction unit, B-105 furnace	0.023 lbs/MMBtu	1.174
NMP extraction unit, B-106 furnace	0.004 lbs/MMBtu	0.352
Oil hydrotreating unit	0.004 lbs/MMBtu	0.059
Sulfur recovery unit incinerator	0.004 lbs/MMBtu	0.090
Asphalt oxidizer number 1	0.000 lbs/ton	0.000
Asphalt oxidizer number 2	0.000 lbs/ton	0.000
Asphalt oxidizer number 3	0.000 lbs/ton	0.000
Tail gas unit (new)	0.110 lbs/ton	0.103
Wastewater sludge fluid bed incinerator	0.173 lbs/ton	6.84
	based on 79,000 lbs/hr fluidizing air flow	
FCU 500	1.220 lbs/1,000 lbs coke burned	73.20
FCU 600	1.10 lbs/1,000 lbs coke burned	55.00
DDU WB-301	0.004 lbs/MMBtu	0.250
DDU WB-302	0.004 lbs/MMBtu	0.240
Hydrogen unit B-1	0.009 lbs/MMBtu	3.340
ASSOCIATED BOX	0.310 lbs/MMBtu	4.450
Wood chip fired space heating boiler		
ATLAS BLACKTOP	0.025 lbs/ton	4.440
Drum mix asphalt plant		
BUCKO CONSTRUCTION	0.017 lbs/hr	4.440
Rotary dryer		
C and A WALLCOVERING	0.007 lbs/MMBtu	0.095
Scotch marine boiler		
CERTIFIED CONCRETE INC.	0.0013 lbs/ton	0.350
Central mix		
COMMONWEALTH EDISON COMPANY	0.100 lbs/MMBtu	213.00
Unit 3	0.100 lbs/MMBtu	356.80
Unit 4		
E.I. DUPONT	1.439 lbs/ton	6.0
Sodium silicate furnace		
EAST CHICAGO INCINERATOR	0.010 gr/dscf	3.470
Each stack serving incinerator (2 units)		
GENERAL REFRACTORY	0.041 lbs/ton	0.410
Ball milling storage	0.012 lbs/ton	0.460
Crushing and sizing	0.003 lbs/ton	0.220
Material handling system	0.006 lbs/ton	0.150
Material loading	0.064 lbs/ton	0.350
Material weighing		

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Mixing and packaging	0.354 lbs/ton	2.480
Sizing, conveying, and storage	0.029 lbs/ton	0.580
GEORGIA PACIFIC		
Boiler number 1		
GLOBE INDUSTRIES		
Stack serving asphalt saturators (2 units)	0.129 lbs/MMBtu	9.380
HAMMOND LEAD PRODUCTS—HALOX PLANT		
Stack 17-S-40	0.060 lbs/ton of product	4.500
Stack 20-S-36		
Stack 20-S-41	0.030 gr/dscf	2.120
Stack 20-S-37	0.022 gr/dscf	0.395
Stack 20-S-38	0.022 gr/dscf	0.450
Stack 17-S-25	0.022 gr/dscf	0.200
Stack 20-S-42	0.022 gr/dscf	0.087
Stack 20-S-43	0.030 gr/dscf	2.120
Stack 20-S-39	0.022 gr/dscf	0.200
Stack 20-S-44	0.022 gr/dscf	0.087
Stack 13-S-48	0.022 gr/dscf	0.496
Stack 14-S-45	0.022 gr/dscf	0.496
HAMMOND LEAD—HALSTAB PLANT	0.022 gr/dscf	0.471
Stack S-1	0.022 gr/dscf	0.471
Stack S-2		
Stack S-4	0.022 gr/dscf	0.220
Stack S-5	0.022 gr/dscf	0.080
Stacks S-6, S-7, and S-8, each stack	0.022 gr/dscf	1.460
Stacks S-9, S-10, S-11, S-12, S-13, S-14, S-15, and S-16, each stack	0.022 gr/dscf	1.030
Stack S-17	0.022 gr/dscf	0.570
HAMMOND LEAD PRODUCTS—LEAD PLANT	0.022 gr/dscf	0.200
Stack 1-S-54	0.022 gr/dscf	1.990
Stack 4A-S-8		
Stack 14-S-16	0.0 gr/dscf	0.000
Stack 1-S-2	0.022 gr/dscf	0.250
Stack 1-S-26	0.022 gr/dscf	0.250
Stack 16-S-56	0.022 gr/dscf	0.250
Stack 1-S-52	0.022 gr/dscf	0.250
Stack 1-S-27	0.022 gr/dscf	1.000
Stack 4-S-35	0.022 gr/dscf	1.000
Stack 6-S-33	0.022 gr/dscf	0.290
Stack 4B-S-34	0.022 gr/dscf	0.570
Stack 6-S-47	0.022 gr/dscf	0.900
V-1	0.022 gr/dscf	0.400
Stack 14-S-15	0.022 gr/dscf	0.400
HARBISON WALKER	0.022 gr/dscf	1.000
Each stack serving tunnel kiln numbers 1 (S-6) and 2 (S-3)	0.022 gr/dscf	0.320
Each stack serving tunnel kiln numbers 1 (S-6) and 2 (S-3) if only one kiln is in operation	1.36 lbs/ton	4.50
Lanley oven (S-7)	1.36 lbs/ton	8.40
Basic dryer (stack 8)		
Chrome ore crushing (D-9)	0.210 lbs/ton	0.840
Chrome ore rotary dryer (D-10)	0.916 lbs/ton	3.020
Chrome ore handling (D-11) and storage	0.024 lbs/ton	0.490
Chrome ore screening (D-12) and milling	0.032 lbs/ton	0.640
Chrome ore finished (D-13) material handling and storage	0.020 lbs/ton	0.410
Magnesite unloading and crushing (D-18)	0.078 lbs/ton	1.240
Magnesite material handling and storage (D-2)	0.044 lbs/ton	0.700
	0.017 lbs/ton	0.580
	0.012 lbs/ton	0.410

Final Rules

Magnesite screening and milling (D-8)
 Specialty magnesite handling system (D-16)
 Magnesite chrome ore mixer number 3 (D-6)
 Magnesite chrome ore mixer number 2 and flat mixer (D-5)
 Magnesite chrome ore mixer number 1 (D-4)
 Magnesite carbon mixers (D-7)
 Magnesite smooth roll crusher system (D-15)
 Magnesite auxiliary milling system (D-14)

INLAND STEEL

Number 4 slab mill scarfer
 Number 2A bloomer scarfer
 Mold foundry baghouse
 Sinter plant discharge end and cooler baghouse
 Sinter plant windbox baghouse
 Lime plant silo baghouses
 Lime plant firing and kiln baghouses
 Number 4 roll shop erwin blaster/baghouse

Number 4 roll shop wheelabrator baghouse

Number 4A roll shop erwin blaster/baghouse

Number 4A roll shop pangborn blaster/baghouse

Number 2 roll shop pangborn blaster/baghouse

Number 6 roll shop roll blaster/baghouse

Electric shop blasters/baghouses

Number 11 coke battery preheaters (2 units)

Number 11 coke battery shed baghouse

Number 6 coke battery underfire stack

Number 7 coke battery underfire stack

Number 8 coke battery underfire stack

Number 9 coke battery underfire stack

Number 10 coke battery underfire stack

Number 11 coke battery underfire stack

Number 7B blast furnace canopy baghouse

Number 7 blast furnace stockhouse pellet baghouse

Number 7 blast furnace casthouse baghouse

Number 7 blast furnace coke screening baghouse

Number 7 blast furnace stockhouse coke baghouse

Number 1 blast furnace stoves (4 units)

Number 2 blast furnace stoves (4 units)

Number 2 basic oxygen furnace number 10 furnace stack

Number 2 basic oxygen furnace number 20 furnace stack

Number 2 basic oxygen furnace caster fume collection baghouse

Number 2 basic oxygen furnace ladle metallurgical station baghouse

Number 2 basic oxygen furnace secondary ventilation system scrubber

Number 2 basic oxygen furnace tundish dump baghouse

Number 2 basic oxygen furnace charging aisle reladling - desulfurization baghouse

0.051 lbs/ton	1.280
0.097 lbs/ton	0.260
0.033 lbs/ton	0.230
0.033 lbs/ton	0.460
0.033 lbs/ton	0.230
0.054 lbs/ton	0.460
0.067 lbs/ton	0.500
0.086 lbs/ton	0.170
0.039 lbs/ton	21.97
0.107 lbs/ton	10.70
0.011 gr/dscf	26.00
0.01 gr/dscf TSP	11.70 TSP
0.007 gr/dscf TSP	17.00 TSP
0.085 lbs/ton	5.530
0.110 lbs/ton	7.149
0.0052 gr/dscf TSP	0.210 TSP
0.0052 gr/dscf TSP	0.260 TSP
0.0052 gr/dscf TSP	0.210 TSP
0.0052 gr/dscf TSP	0.260 TSP
0.0052 gr/dscf TSP	0.270 TSP
0.0052 gr/dscf TSP	0.200 TSP
0.0052 gr/dscf TSP	1.070 TSP
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.003 gr/dscf	11.22
0.0052 gr/dscf	4.00
0.011 gr/dscf TSP	22.00 TSP
0.007 gr/dscf TSP	4.200 TSP
0.01 gr/dscf TSP	2.00 TSP
0.000	0.000
0.000	0.000
0.058 lbs/ton TSP	16.00 TSP
0.058 lbs/ton TSP	16.00 TSP
0.0052 gr/dscf TSP	2.00 TSP
0.0052 gr/dscf TSP	2.00 TSP
0.015 gr/dscf TSP	12.00 TSP
0.0052 gr/dscf TSP	2.200 TSP
0.011 gr/dscf TSP	28.30 TSP

Final Rules

Number 2 basic oxygen furnace truck and ladle hopper baghouse	0.0052 gr/dscf TSP	0.800 TSP
Number 2 basic oxygen furnace flux storage and batch baghouse	0.0052 gr/dscf TSP	0.530 TSP
Number 4 basic oxygen furnace reladling and desulfurization baghouse	0.0052 gr/dscf TSP	8.26 TSP
Number 4 basic oxygen furnace scrubber stack (steelmaking)	0.187 lbs/ton TSP	100.00 TSP
Number 4 basic oxygen furnace vacuum degassing baghouse	0.01 gr/dscf TSP	4.280 TSP
Number 4 basic oxygen furnace secondary ventilation system baghouse	0.006 gr/dscf TSP	22.30 TSP
Stack serving blast furnace stove, number 5 (3 units)	0.016 lbs/MMBtu	4.70
Stack serving blast furnace stove, number 6 (4 units)	0.016 lbs/MMBtu	3.64
Stack serving blast furnace stove, number 7 (3 units)	0.0076 lbs/MMBtu	6.32
Stack serving "A" blast furnace stoves (3 units)	0.021 lbs/MMBtu	5.090
Stack serving "B" blast furnace stoves (3 units)	0.021 lbs/MMBtu	5.090
100 inch plate mill rehear furnace	0.078 lbs/MMBtu	13.74
Number 2 bloom mill soaking pit, numbers 1 through 4	0.000	0.000
Number 2 bloom mill soaking pit numbers 5 through 16 collective	0.000	0.000
Number 2 bloom mill soaking pit numbers 19 through 20 collective	0.000	0.000
Number 4 slabber soaking pit numbers 1 through 18 collective	0.000	0.000
Number 4 slabber soaking pit numbers 19 through 45 collective	0.0 lbs/MMBtu	0.0
Stack serving number 2AC station boiler numbers 207 through 210	0.006 lbs/MMBtu	1.750
Stack serving number 2AC station boiler numbers 211 through 213	0.000	0.000
Stack serving number 3AC station boiler numbers 301 through 304	0.018 lbs/MMBtu	16.20
Number 3AC station boiler number 305	0.018 lbs/MMBtu	16.20
Stack serving number 4AC station boiler number 401 through 404	0.018 lbs/MMBtu	5.400
Number 4AC station boiler number 405	0.042 lbs/MMBtu	76.578
Stack serving number 5 boiler house (3 units)	0.028 lbs/MMBtu	18.78
Electric arc furnace shop direct shell evacuation system baghouse roof monitor	0.013 lbs/MMBtu	18.05
Electric arc furnace shop ladle metallurgical station baghouse	0.0052 gr/dscf	17.14
Coal conveyor transfer baghouse A	0.01 gr/dscf	0.820
Blending system baghouse B	0.003 gr/dscf	0.17
Coal storage bin baghouse C	0.003 gr/dscf	0.54
Coal pulverizer baghouse D	0.003 gr/dscf	0.23
Coal pulverizer baghouse E	0.0015 gr/dscf	0.93
Number 7 blast furnace coal storage bin baghouse F	0.0015 gr/dscf	0.93
Number 7 blast furnace coal storage bin baghouse G	0.003 gr/dscf	0.09
Numbers 5 and 6 blast furnace coal storage bin baghouse H	0.003 gr/dscf	0.09
KEIL CHEMICAL		
Clever brooks boiler B-4	0.007 lbs/MMBtu	0.09
Clever brooks boiler B-5	0.007 lbs/MMBtu	0.14
VA power B-3 boiler	0.007 lbs/MMBtu	0.04
Chlorinated wax process	0.001 lbs/ton	0.003
Pyro-chek 68PB1	0.052 lbs/ton	0.030
Pyro-chek 77PB2	0.122 lbs/ton	0.040
Sulfurized fat process	0.157 lbs/ton	0.230
KEYES FIBER		
Molded pulp dryer number 1	0.546 lbs/ton	0.210
Molded pulp dryer number 2	0.546 lbs/ton	0.250
Molded pulp dryer number 3	0.546 lbs/ton	0.290
Molded pulp dryer number 4	0.546 lbs/ton	0.290
Molded pulp dryer number 5	0.546 lbs/ton	0.130
Molded pulp dryer number 6	0.546 lbs/ton	0.130
Molded pulp dryer number K34	0.546 lbs/ton	0.130
Molded pulp dryer number 8	0.546 lbs/ton	0.350
Molded pulp dryer number 9	0.546 lbs/ton	0.410

Final Rules

Molded pulp dryer number 10	0.546 lbs/ton	0.350
Babcock and Wilcox boiler	0.007 lbs/MMBtu	0.050
LTV STEEL CORPORATION		
Stack serving number 3 blast furnace stoves	0.027 lbs/MMBtu	11.73
Stack serving number 4 blast furnace stoves	0.027 lbs/MMBtu	12.93
Stack serving hot strip mill slab heat furnace numbers 1, 2, and 3	0.086 lbs/MMBtu	36.56
Utility boiler number 3	0.066 lbs/MMBtu	12.85
Utility boiler number 4	0.066 lbs/MMBtu	12.85
Utility boiler number 5	0.066 lbs/MMBtu	25.69
Utility boiler number 6	0.066 lbs/MMBtu	25.69
Utility boiler number 7	0.066 lbs/MMBtu	25.69
Utility boiler number 8	0.066 lbs/MMBtu	61.59
Basic oxygen furnace main stack	0.018 gr/dscf	69.40
Reladling and desulfurization baghouse	0.008 gr/dscf	10.49
Ladle metallurgical station baghouse	0.004 gr/dscf	3.630
Sinter plant breaker discharge end	0.02 gr/dscf TSP	18.05 TSP
Sinter plant windbox stack 08	0.02 gr/dscf TSP	49.70 TSP
LEHIGH PORTLAND CEMENT		
Raw ball mill RRM-1	0.085 lbs/ton	2.680
Pelletizer PP-1	0.051 lbs/ton	1.130
Pelletizer PP-2	0.051 lbs/ton	1.130
Green pellet dryer	0.111 lbs/ton	4.400
Preheater KP	0.198 lbs/ton	4.000
KK1 calcinator aluminate rotary kiln-lumnite plant	0.433 lbs/ton	8.670
Clinker cooler	0.556 lbs/ton	13.22
Finish ball mill	0.079 lbs/ton	1.660
Oil fired boiler	0.006 lbs/MMBtu	0.070
Number 1 bulk tank	0.001 lbs/ton	0.024
Number 2 bulk tank	0.001 lbs/ton	0.024
Number 3 bulk tank	0.001 lbs/ton	0.024
Silo baghouse number 1	0.120 lbs/ton	1.800
Silo baghouse number 2	0.120 lbs/ton	1.800
Silo baghouse number 3	0.120 lbs/ton	1.800
Silo baghouse number 4	0.120 lbs/ton	1.800
Heated hammermill	0.0032 lbs/ton	0.192
LEVER BROTHERS		
Boiler house, building number 8, boiler number 2	0.116 lbs/MMBtu	9.570
Stack serving boiler house, building number 8, boiler numbers 3 and 4	0.116 lbs/MMBtu	18.88
Dowtherm boiler, DEFI process building 6	0.004 lbs/MMBtu	2.700
Milling and pelletizer soap dust collection system (DC-1), building number 15	0.020 gr/dscf	0.100
Powder dye dust collector system (DC-4), building number 15	0.020 gr/dscf	0.130
Schenble wet scrubber and demister collector system, building number 15	0.030 gr/dscf	1.030
Each stack serving detergent bar soap noodle bins numbers 1, 2, and 3 dust collection system (DC-5, DC-6, and DC-7)	0.020 gr/dscf	0.210
Stack serving chip mixers numbers 1, 2, and 3 soap dust collection system, building number 15 (DC-8, DC-9, and DC-2)	0.020 gr/dscf	0.720
Rework soap dust collection system (DC-3), building number 15	0.020 gr/dscf	0.800
Three chill rolls and apron conveyors (DC-10), building number 15	0.020 gr/dscf	1.090
High titer granules and chips manufacturing process, building number 6	0.930 lbs/ton	3.500
Detergent bar soap manufacturing process number 1, stack 7, building number 6	1.140 lbs/ton	4.000
Detergent bar soap manufacturing process number 2, stack 16A, building number 6	1.140 lbs/ton	4.000
Bulk filtral unloading bleached earth dust collection system, building number 1	0.020 gr/dscf	0.070
Oil refinery/filter aid bag dumping operation, building number 1	0.020 gr/dscf	0.220
3 soap dryers dust collection system, building number 14	0.020 gr/dscf	0.120
6 noodle bins and 1 scrap kettle dust collection system, building number 3	0.020 gr/dscf	0.860
Dust collector system for soap rework grinding process, building number 14	0.020 gr/dscf	0.250

Final Rules

Stack serving hard soap finishing lines numbers 1, 2, 3, 5, 7, and 8 dust collection system (DC), building number 14	0.020 gr/dscf	1.540
Sulfonation process		
Soap dryer cleanout system, tank number 1, building number 14	0.205 lbs/ton	0.390
Soap dryer cleanout system, tank number 2, building number 14	0.030 gr/dscf	0.390
Crude glycerine filter aid dust collection system, building number 2	0.030 gr/dscf	0.300
Glycerine carbon handling dust collection system, building number 2	0.020 gr/dscf	0.130
Bulk urea handling system, new detergent bulk soap, building number 15A	0.020 gr/dscf	0.170
American hydrotherm boiler 2, stack 1A, building number 15A	0.020 gr/dscf	0.100
Schenble wet scrubber and demister collection system, stack 2A, building number 15A	0.150 lbs/MMBtu	1.830
	0.030 gr/dscf	1.030
Flex Kleen dust collection system DC-1053, stack 3A, building number 15A	0.020 gr/dscf	0.940
Flex Kleen dust collection system DC-1054, stack 4A, building number 15A	0.020 gr/dscf	0.940
Flex Kleen dust collection system DC-1055, stack 5A, building number 15A	0.020 gr/dscf	0.940
Flex Kleen dust collection system DC-1056, stack 6A, building number 15A	0.020 gr/dscf	0.940
Flex Kleen dust collection system DC-1050, stack 7A, building number 15A	0.020 gr/dscf	2.130
Flex Kleen dust collection system DC-1052, stack 8A, building number 15A	0.020 gr/dscf	2.130
Bulk Borax unloading to storage silo, stack 9A, building number 8	0.020 gr/dscf	0.130
Oil refinery/filter aid mixing tank number 44, building number 1, stack 15A	0.060 lbs/ton	0.030
Sample detergent bar soap line operation, building 14, stack 17A	0.002 lbs/ton	0.002
MARBLEHEAD LIME COMPANY		
Flue dust loadout number 1 (MHL 14)	0.003 lbs/ton	0.110
Flue dust loadout number 2 (MHL 15)	0.003 lbs/ton	0.100
Lime grinder (MHL 13)	0.015 lbs/ton	0.440
Lime handling baghouse number 1 (MHL 6)	0.002 lbs/ton	0.260
Lime handling baghouse number 2 (MHL 7)	0.002 lbs/ton	0.180
Lime handling baghouse number 3 (MHL 8)	0.0004 lbs/ton	0.050
Lime handling baghouse number 4 (MHL 9)	0.001 lbs/ton	0.130
Lime loadout baghouse number 1 (MHL 10)	0.0004 lbs/ton	0.050
Lime loadout baghouse number 2 (MHL 11)	0.0004 lbs/ton	0.050
Lime loadout baghouse number 3 (MHL 12)	0.004 lbs/ton	0.410
Lime rotary kiln number 1	0.478 lbs/ton	9.950
Lime rotary kiln number 2	0.478 lbs/ton	9.950
Lime rotary kiln number 3	0.478 lbs/ton	9.950
Lime rotary kiln number 4	0.478 lbs/ton	9.950
Lime rotary kiln number 5	0.478 lbs/ton	9.950
MARPORT SMELTING		
North baghouse	0.601 lbs/ton	2.300
South baghouse	1.279 lbs/ton	4.900
METHODIST HOSPITAL		
Boiler number 1		
NATIONAL RECOVERY SYSTEMS		
Drying system	0.044 lbs/MMBtu	0.350
Material storage handling	0.203 lbs/ton	4.060
Each stack serving lime fines storage silos (2 stacks)	0.034 lbs/ton	0.680
	0.001 lbs/ton	0.012
NIPSCO-MITCHELL		
Stack serving boilers numbers 6 and 11	0.100 lbs/MMBtu	235.70
Stack serving boilers numbers 4 and 5	0.100 lbs/MMBtu	128.750
PREMIER CANDY COMPANY		
Boiler number 1 (North)	0.069 lbs/MMBtu	0.420
Boiler number 2 (South)	0.069 lbs/MMBtu	0.450
QUANEX LASALLE STEEL		
Fume scrubber		
Number 11 furnace precipitator	0.015 lbs/ton	0.060
Stack serving shot blast baghouse (2 units)	0.548 lbs/ton	0.940
	0.001 lbs/ton	0.020
REED MINERALS PLANT #14		

		Final Rules	
Fluidized bed dryer		0.015 gr/dscf	3.5
Crushing and screening		0.015 gr/dscf	9.0
RHONE POULENC			
Package boiler		0.007 lbs/MMBtu	0.755
Preheater		0.007 lbs/MMBtu	0.230
Sulfuric acid production unit number 3		0.150 lbs/ton acid produced	1.560 acid mist
Sulfuric acid production unit number 4		0.150 lbs/ton acid produced	6.958 acid mist
UNION CARBIDE			
Cylinder paint spray booth, stack 033		42.5 lbs/ton	0.340
Drum shotblaster and baghouse, stack 075		0.002 gr/dscf	0.028
Drum paint spray booth, stack 073		42.5 lbs/ton	0.340
Cylinder shotblaster number 2 baghouse, stack 030.		0.004 gr/dscf	0.042
Generators, numbers 1 through 6		0.008 lbs/MMBtu	0.279
Cylinder shotblaster number 1 baghouse, stack 031		0.002 gr/dscf	0.020
UNION TANK CAR COMPANY			
Grit blaster		0.002 lbs/ton	0.020
U.S. GYPSUM COMPANY			
Raw material handling		0.010 gr/dscf	0.070
Rail car unloading, stack J10		0.015 gr/dscf	0.190
Each stack serving raw material conveying and storage, stacks J11, J12, and J13			
Rock handling process		0.012 gr/dscf	3.210
Drying, grinding, and calcining, stack M1		0.015 gr/dscf	2.210
Stucco elevating and conveying, stack M2		0.011 gr/dscf	0.313
Franklin fiber process, stack M6			
Wallboard manufacturing process		0.020 gr/dscf	2.230
Paper grinding and stucco system, stack B1		0.020 gr/dscf	0.860
Wallboard end sawing, stack B2		0.020 gr/dscf	0.260
Speciality board manufacturing process (kerfing), stack B3		0.017 lbs/ton	0.100
Each stack serving ready mix process, stacks J1, J2, and J3			
Dry texture paint process		0.020 gr/dscf	0.190
Mixing and packing, stack J4		0.010 gr/dscf	0.100
Bag dumping, stack J5		0.010 gr/dscf	0.030
Dry additive conveying, stack J6			
Dry joint compound process		0.020 gr/dscf	0.340
Mixing and packing, stack J7		0.010 gr/dscf	0.020
Additive air conveying, stack J8		0.020 gr/dscf	0.140
Panel saw process			
U.S. REDUCTION COMPANY			
Crusher system		0.187 lbs/ton raw material	2.810
Milling system number 1		0.180 lbs/ton raw material	2.700
Milling system number 2		0.180 lbs/ton raw material	1.260
Reverberatory furnaces numbers 1, 2, 3, and 5 and borings dryer. Only 3 furnaces and the borings chip dryer shall operate at the same time while operating 4 baghouses identified as numbers 1, 2, 3, and 5.		0.271 lbs/ton aluminum produced	8.370
USS—Gary Works			
Each stack serving number 3 sinter plant coolers		0.03 gr/dscf TSP	154.3 TS
Number 3 sinter plant discharge area baghouse		0.02 gr/dscf	5.12
Number 3 sinter plant screening station baghouse		0.0052 gr/dscf	7.5
S1/S2 baghouse		0.0052 gr/dscf	0.83
Number 3 sinter plant storage bins building baghouse		0.01 gr/dscf	1.300
Each stack serving number 3 sinter plant windbox stacks		0.065 gr/dscf TSP	167.1

Final Rules

Number 2 QBOP flux handling lime baghouse	0.01 gr/dscf	2.600
Coke battery number 2 underfire stack	0.05 gr/dscf	27.54
Coke battery number 3 underfire stack	0.05 gr/dscf	42.140
Coke battery number 5 underfire stack	0.05 gr/dscf	16.80
Coke battery number 7 underfire stack	0.05 gr/dscf	20.40
Each stack serving number 2 precarbon building precipitators (3 units)	0.06 gr/dscf	2.5
Each stack serving number 3 precarbon building precipitators (3 units)	0.06 gr/dscf	2.5
Each stack serving number 1 BOP gas cleaning (2 units)	0.02 gr/dscf	17.2
Each stack serving number 2 QBOP gas cleaning (2 units)	0.02 gr/dscf	18.20
Number 2 QBOP hot metal desulfurization baghouse (8 stacks)	0.0052 gr/dscf	1.44
New 2 QBOP secondary baghouse	0.0052 gr/dscf	25.9
Number 1 basic oxygen furnace iron desulfurization baghouse	0.01 gr/dscf	9.32
Number 2 QBOP ladle metal baghouse number 1	0.01 gr/dscf	6.86
Number 2 QBOP ladle metal baghouse number 2	0.01 gr/dscf	2.44
Number 2 QBOP ladle metallurgy facility number 3 reheat furnace hot fume extraction and material handling baghouse	0.01 gr/dscf	4.33
Number 13 blast furnace sinter screening station number 13 baghouse	0.02 gr/dscf	2.5
Stack serving blast furnace stove number 4	0.029 lbs/MMBtu	11.60
Stack serving blast furnace stove number 6	0.029 lbs/MMBtu	11.6
Stack serving blast furnace stove numbers 7 and 8	0.029 lbs/MMBtu	23.20
Stack serving blast furnace stove number 13	0.015 lbs/MMBtu	21.20
Each stack serving boiler house number 4	0.036 lbs/MMBtu	13.155
Number 2 coke plant boiler house, boiler number 3	0.020 lbs/MMBtu	2.7
Stack serving number 2 coke plant boiler house, boiler numbers 4 and 5	0.033 lbs/MMBtu	10.0
Number 2 coke plant boiler house, boiler number 6	0.020 lbs/MMBtu	3.000
Number 2 coke plant boiler house, boiler number 7	0.011 lbs/MMBtu	1.800
Number 2 coke plant boiler house, boiler number 8	0.011 lbs/MMBtu	2.61
Each stack serving turboblower boiler numbers 1 through 5	0.025 lbs/MMBtu	8.400
Turboblower boiler number 6	0.025 lbs/MMBtu	16.58
Each stack serving 84 inch hot strip mill, reheat furnaces (4 units)	0.064 lbs/MMBtu	28.2
84 inch hot strip mill, waste heat boiler number 1	0.064 lbs/MMBtu	10.9
84 inch hot strip mill, waste heat boiler number 2	0.064 lbs/MMBtu	12.8
Each stack serving 160/210 inch plate mill, batch reheat furnace numbers 1 through 4	0.011 lbs/MMBtu	0.33
160/210 inch plate mill, continuous reheat furnace number 1	0.011 lbs/MMBtu	2.75
160/210 inch plate mill, continuous reheat furnace number 2	0.011 lbs/MMBtu	2.75
Stack serving 160/210 inch continuous heat treating furnaces 1, 2, 3, and 4	0.011 lbs/MMBtu	1.1

(e) The following opacity limits shall be complied with and shall take precedence over those in 326 IAC 5-1-2 with which they conflict:

Source

EAST CHICAGO INCINERATOR INLAND STEEL

Electric arc furnace direct shell evacuation system baghouse	10%, 6 minute average
Electric furnace shop roof monitor	5%, 6 minute average
Electric furnace shop ladle metallurgical station baghouse	20%, 6 minute average
Number 2 basic oxygen furnace, number 10 furnace off-gas scrubber	5%, 6 minute average
Number 2 basic oxygen furnace, number 20 furnace off-gas scrubber	20%, 6 minute average
Number 2 basic oxygen furnace caster fume collection baghouse	5%, 3 minute average
Number 2 basic oxygen furnace charging isle and reladling desulfurization baghouse	5%, 3 minute average
Number 2 basic oxygen furnace flux storage and batch baghouse	5%, 3 minute average
Number 2 basic oxygen furnace ladle metallurgy station baghouse	5%, 3 minute average

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Number 2 basic oxygen furnace roof monitor	20%, 3 minute average
Number 2 basic oxygen furnace secondary ventilation system scrubber	20%, 6 minute average
Number 2 basic oxygen furnace truck and ladle hopper baghouse	5%, 3 minute average
Number 2 basic oxygen furnace tundish dump baghouse	5%, 3 minute average
Number 4 basic oxygen furnace off-gas scrubber	20%, 6 minute average
Number 4 basic oxygen furnace reladling and desulfurization baghouse	5%, 3 minute average
Number 4 basic oxygen furnace roof monitor	20%, 3 minute average
Number 4 basic oxygen furnace secondary ventilation system baghouse	5%, 3 minute average
Number 4 basic oxygen furnace vacuum degassing material handling baghouse	5%, 3 minute average
Number 7 blast furnace casthouse	15%, 6 minute average
LTV STEEL CORPORATION	
Basic oxygen furnace ladle metallurgical station baghouse	5%, 3 minute average
Basic oxygen furnace main stack	20%, 6 minute average
Basic oxygen furnace reladling and desulfurization baghouse	5%, 3 minute average
Basic oxygen furnace shop roof monitor	20%, 3 minute average
USS—Gary Works	
Number 1 basic oxygen furnace iron desulfurization baghouse	5%, 3 minute average
Number 1 basic oxygen furnace roof monitor	20%, 3 minute average
Number 1 basic oxygen process gas cleaning (2 units)	20%, 6 minute average
Number 2 QBOP hot metal desulfurization baghouse	5%, 3 minute average
Number 2 QBOP gas cleaning	20%, 6 minute average
Number 2 QBOP roof monitor	20%, 3 minute average
Number 2 QBOP flue handling line baghouse	5%, 3 minute average
New 2 QBOP secondary baghouse	5%, 3 minute average
Number 2 QBOP ladle metallurgy baghouse number 1	5%, 3 minute average
Number 2 QBOP ladle metallurgy baghouse number 2	5%, 3 minute average

(f) Test methods for this section shall be as follows:

(1) Emissions of PM_{10} shall be measured by any of the following methods:

- (A) 40 CFR 51, Appendix M, Method 201.
- (B) 40 CFR 51, Appendix M, Method 201A.
- (C) The volumetric flow rate and gas velocity shall be determined in accordance with 40 CFR 60, Appendix A, Methods 1, 1A, 2, 2A, 2C, 2D, 3, or 4^o.

(2) Emissions for TSP matter shall be measured by the following methods:

- (A) 40 CFR 60, Appendix A, Methods 5, 5A, 5D, 5E, or 17^o. Method 17 may not be used when the stack gas temperature exceeds two hundred forty-eight degrees Fahrenheit (248°F) ($\pm 25^\circ F$).
- (B) The volumetric flow rate and gas velocity shall be determined in accordance with 40 CFR 60, Appendix A, Methods 1, 1A, 2, 2A, 2C, 2D, 3, or 4^o.

(3) Measurements of opacity shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9^o, except for those sources where a three (3) minute averaging time is required. Sources requiring a three (3) minute averaging time are subject to all parts of Method 9 except the six (6) minute averaging provision. In these

cases, the opacity shall be determined as an average of twelve (12) consecutive observations recorded at fifteen (15) second intervals.

(4) Emissions of sulfuric acid mist shall be measured in accordance with 40 CFR 60, Appendix A, Method 8^o.

(5) Compliance with the mass emission limits for the sinter plant windbox stacks at USS Gary in subsection (d) shall be determined by the simultaneous sampling and analysis of both noncondensibles (front half) and condensibles (back half) particulate matter. The quantity of noncondensibles particulate matter in the gas stream shall be determined in accordance with the procedures specified in 40 CFR 60, Appendix A, Method 5. The quantity of condensible particulate matter in the gas stream shall be determined in accordance with 40 CFR 51, Appendix M, Method 202, with the following modifications:

- (A) A heated Method 5 out of stack filter shall be used instead of an in-stack filter.
- (B) The impinger system shall consist of five impingers. The first three (3) impingers shall contain one hundred (100) milliliters of deionized water, the fourth shall be empty, and the fifth shall contain

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silica gel.

(C) The first four (4) impingers shall be used to determine the quantity of condensible particulate emissions.

Compliance shall be achieved if the sum of the front half and the back half is less than or equal to the mass emission limit of 167.1 lbs/hr and the front half catch is less than or equal to the mass concentration limit of 0.065 gr/dscf in subsection (d).

(g) The installation and operation of opacity continuous emissions monitors shall be conducted according to procedures specified in 326 IAC 3. Prior to December 10, 1993, the following facilities shall have a continuous emission monitor for opacity installed and operating:

- (1) Coke battery underfire stacks at USS.
- (2) LTV basic oxygen furnace precipitator main stack.

(3) USS numbers 2 and 3 precarbon building preheating and drying line exhaust gas precipitators (six (6) units). One (1) opacity continuous emission monitor shall be installed prior to December 10, 1993. The remaining five (5) opacity continuous emission monitors shall be installed prior to December 31, 1994. Based on an evaluation of the technical feasibility of operation of the first monitor on one (1) line, USSteel may petition for a one (1) year extension of the requirement to install the remaining five (5) monitors or for a waiver for installation and operation of the six (6) opacity continuous emission monitors. USSteel shall include information on the moisture content of the gases and their effect on accurate opacity measurements as part of any such petition.

(h) The following combustion sources shall fire natural gas only:

Source	Units	lbs/hr
ADVANCED ALUMINUM PRODUCTS		
Number 2 annealer	0.003 lbs/MMBtu	0.048
Number 3 annealer	0.003 lbs/MMBtu	0.048
Annealing furnace	0.003 lbs/MMBtu	0.040
Boiler	0.003 lbs/MMBtu	0.010
AMERICAN CAN		
Stack serving basecoat ovens (6 units)	0.003 lbs/MMBtu	0.210
Boiler number 4	0.003 lbs/MMBtu	0.010
Stack serving boiler numbers 1, 2, and 3	0.003 lbs/MMBtu	0.170
Stack serving Johnson space heater numbers 1 through 4	0.003 lbs/MMBtu	0.060
Stack serving litho ovens (5 units)	0.003 lbs/MMBtu	0.150
AMERICAN MAIZE PRODUCTS (AMAIZO)		
Boiler number 1	0.003 lbs/MMBtu	0.288
Boiler number 2	0.003 lbs/MMBtu	0.468
South dextrin furnace number 1	0.003 lbs/MMBtu	0.023
North dextrin furnace number 2	0.003 lbs/MMBtu	0.023
AMERICAN STEEL FOUNDRY—HAMMOND		
Boiler number 4-5509	0.003 lbs/MMBtu	0.030
Furnaces	0.003 lbs/MMBtu	0.16
AMOCO OIL, WHITING REFINERY		
F-100 marine docks distillate heater	0.003 lbs/MMBtu	0.020
CERTIFIED CONCRETE INC.		
Stack serving 2 boiler units	0.003 lbs/MMBtu	0.035
COMMONWEALTH EDISON COMPANY		
Stack serving emergency backup boiler numbers 2-1 and 2-2	0.003 lbs/MMBtu	0.900
E.I. DUPONT		
Power house (1 unit)	0.003 lbs/MMBtu	0.100
GATX-GEN AMER TRANS		
Stress relief furnace	0.003 lbs/MMBtu	0.120
GENERAL REFRACTORY		
Tunnel kiln	0.003 lbs/MMBtu	0.040
HAMMOND LEAD—HALOX PLANT		
Stack 18-S-24	0.003 lbs/MMBtu	0.025
Stack 18-S-49	0.003 lbs/MMBtu	0.025

HAMMOND LEAD—HALSTAB PLANT

Stack S-18

0.003 lbs/MMBtu 0.008

Stack S-19

0.003 lbs/MMBtu 0.008

INLAND STEEL

12 inch bar mill reheat furnace

0.003 lbs/MMBtu 1.090

Stack serving 21 inch bar mill reheat furnace numbers 1 and 2

0.003 lbs/MMBtu 1.31

Stack serving 76 inch hot strip mill reheat furnace numbers 1, 2, and 3

0.003 lbs/MMBtu 1.310

Stack serving 80 inch hot strip mill furnace numbers 3 and 4

0.003 lbs/MMBtu 3.980

Number 3 cold strip and numbers 5 and 6 annealing furnaces

0.003 lbs/MMBtu 0.987

Number 5 galvanizing line

0.003 lbs/MMBtu 0.44

Number 3 continuous anneal line

0.003 lbs/MMBtu 0.25

Open coil anneal

0.003 lbs/MMBtu 0.25

Plant 1 galvanizing lines

0.003 lbs/MMBtu 0.51

Normalizing line

0.003 lbs/MMBtu 0.13

LTV STEEL CORPORATION

Hot strip space heater numbers 1 through 28

0.003 lbs/MMBtu 0.250 TSP

Sheet mill number 2 portable annealing furnace numbers 1 through 23

0.003 lbs/MMBtu 1.100 TSP

Sheet mill number 2 space heater numbers 1 through 7

0.003 lbs/MMBtu 0.050 TSP

Sheet mill number 3 open coil annealing furnace numbers 1 through 3

0.003 lbs/MMBtu 0.031 TSP

Number 3 sheet mill annealing furnace numbers 1 through 7

0.003 lbs/MMBtu 0.071 TSP

Number 3 sheet mill annealing furnace numbers 1 through 11

0.003 lbs/MMBtu 0.520 TSP

Sheet mill number 2, annealing and galvanizing furnace numbers 2 through 5

0.003 lbs/MMBtu 1.280 TSP

Sheet mill number 2, CRSM boiler numbers 7 and 8

0.003 lbs/MMBtu 0.290 TSP

Number 2 cold reduced strip mill, number 2 galvanizing line, numbers 1 and 2 flame furnaces

0.003 lbs/MMBtu 0.500

Number 2 sheet mill galvanizers 1 and 2

0.003 lbs/MMBtu 0.265 TSP

LEVER BROTHERS

American hydrotherm boiler number 1

0.003 lbs/MMBtu 0.040

NIPSCO—MITCHELL

Each stack serving unit numbers 9A, 9B, and 9C gas turbines

0.003 lbs/MMBtu 0.660

STANDARD FORGINGS

Salem rotary furnace

0.003 lbs/MMBtu 0.120

Stack serving heat treat furnaces (3 units)

0.003 lbs/MMBtu 0.080

UNION CARBIDE

Package boilers (2 units)

0.003 lbs/MMBtu 0.618

Plants numbers 6, 7, and 8 regenerator heaters

0.003 lbs/MMBtu 0.097

UNION TANK CAR CO.

Boiler house, north

0.003 lbs/MMBtu 0.110

Boiler house, south

0.003 lbs/MMBtu 0.110

Number 4 boiler

0.003 lbs/MMBtu 0.020

Number 8 boiler

0.003 lbs/MMBtu 0.010

North stress furnace

0.003 lbs/MMBtu 0.160

Stack serving paint oven unit numbers 1 through 5

0.003 lbs/MMBtu 0.060

South stress furnace

0.003 lbs/MMBtu 0.160

U.S. GYPSUM COMPANY

Each stack serving wallboard drying furnace, stacks B4, B5, and B6

0.003 lbs/MMBtu 0.068

U.S. REDUCTION COMPANY

Preheat melting pot exhaust

0.003 lbs/MMBtu 0.090

USS—GARY WORKS

Electro galvanizing boiler

0.003 lbs/MMBtu 0.110

Number 2 coke plant boiler house, boiler number 1

0.003 lbs/MMBtu 0.385

Number 2 coke plant boiler house, boiler number 2

0.003 lbs/MMBtu 0.385

Tin mill boiler number 5

0.003 lbs/MMBtu 0.480

Tin mill boiler number 1

0.003 lbs/MMBtu 0.240

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Tin mill boiler number 2
 Stack serving tin mill boiler numbers 3 and 4
 160/210 inch plate mill, car bottom heat treating furnace
 160/210 inch plate mill, car bottom normalizing furnace
 160/210 inch plate mill, keep hot pits

0.003 lbs/MMBtu	0.240
0.003 lbs/MMBtu	0.830
0.003 lbs/MMBtu	0.070
0.003 lbs/MMBtu	0.070
0.003 lbs/MMBtu	0.090

(i) (Reserved)

(j) (Reserved)

(k) This subsection lists site specific control requirements. For any facility with a compliance date after December 10, 1993, the company shall submit a schedule for meeting the final compliance date containing milestones for purchase and installation of the equipment and for the operational changes required to assure compliance with the applicable standard prior to the final compliance date. The schedule shall be submitted to the department and to the U.S. EPA prior to December 10, 1993. A violation of any milestone in the submitted schedule constitutes a violation of this rule. The sources listed shall meet the requirements as follows:

(1) The following for American Maize:

(A) Starch dryer number 1 shall be permanently shut down by December 31, 1993.

(B) Starch dryer number 2 stack height shall be increased from eighteen and three-tenths (18.3) meters to thirty (30) meters by December 10, 1993.

(C) Dextrin manufacturing systems 1 through 7 shall be permanently shut down by December 31, 1993.

(D) After December 10, 1993, American Maize shall achieve compliance with the respective limits in section 10.1(d) of this rule. The following mass emission limits shall be applicable until December 10, 1993:

Process	Units	Emission Limit
Each stack serving dextrin manufacturing equipment systems numbers 1 through 7	1.000 lbs/ton	0.50 lbs/hr
Starch flash feed dryer number 1 scrubber	0.086 lbs/ton	8.69 TSP

(2) American Steel Foundry—Hammond. The PM₁₀ mass emission limit in subsection (d) for coil spring grinder numbers 3-0244, 3-0386, 3-0389, 3-0247, 3-0385, 3-0295, and 3-0233 shall be complied with no later than December 31, 1993, and shall be maintained thereafter. The source shall either improve the efficiency of the existing control equipment or replace the existing control equipment with higher efficiency control equipment to comply with emission limits specified in subsection (d).

(3) Commonwealth Edison Company. Units 3 and 4 shall comply with:

(A) a thirty percent (30%), six (6) minute average

opacity limit until December 31, 1992;

(B) a twenty-five percent (25%), six (6) minute average opacity limit from January 1, 1993, to December 31, 1993; and

(C) a twenty percent (20%), six (6) minute average opacity limit after December 31, 1993.

(4) Hammond Lead Products—Halox plant. The stack heights of stacks 17-S-25 and 17-S-40 shall be raised to twenty-one and three-tenths (21.3) meters above grade by December 10, 1993.

(5) The following for Inland Steel:

(A) Number 2 BOF facility roof monitor. The twenty percent (20%), three (3) minute average opacity standard in subsection (e) shall be achieved no later than December 31, 1994, and shall be maintained thereafter. Prior to December 31, 1994, the opacity standard shall be the thirty percent (30%), six (6) minute average. Compliance with this limitation shall be determined by 40 CFR 60, Appendix A, Method 9*, except that the three (3) minute, twenty percent (20%) opacity standard shall be determined as an average of twelve (12) consecutive observations recorded at fifteen (15) second intervals.

(B) Numbers 8 and 11 coke batteries. Operation of the number 8 coke battery and its underfire stack and number 11 coke battery and its associated quench tower, underfire stack, and preheater stacks shall be permanently discontinued before December 31, 1992.

(C) Number 10 coke battery. After the shutdown of the number 8 coke battery, the electrostatic precipitator associated with the number 8 coke battery shall be connected to the number 10 coke battery prior to December 31, 1992.

(D) Numbers 6, 7, 9, and 10 coke batteries. These coke batteries and associated quench towers and underfire stacks shall not operate after December 31, 1994. Prior to December 31, 1994, these coke batteries shall meet the requirement of section 10.2 of this rule with the following exceptions:

(i) There shall be no visible emissions from more than ten percent (10%) of the standpipes on operating ovens on a battery.

(ii) Visible emissions shall not exceed twenty percent (20%) averaged over six (6) consecutive observations during any pushing operation.

(iii) Mass emissions from the coke battery underfire stacks shall not exceed fifty-thousandths

(0.050) gr/dscf.

(E) Number 4 BOF facility roof monitor. The twenty percent (20%), three (3) minute average opacity standard in subsection (e) shall be achieved no later than December 31, 1994, and shall be maintained thereafter. Prior to December 31, 1994, the opacity standard shall be the twenty-five percent (25%), six (6) minute average.

(F) Number 7 blast furnace casthouse. Tapping emissions from the number 7 blast furnace casthouse shall be controlled by a hood vented to a baghouse on and after December 1, 1992. Canopy hoods shall be installed above each of the four (4) furnace tap holes. The hoods shall be ducted to a new three hundred seventy thousand (370,000) actual cubic feet per minute minimum design flow rate baghouse. Each hood shall be located just above the casthouse crane and extend via vertical sheeting to the casthouse roof. The system shall provide a minimum of one hundred eighty-five thousand (185,000) actual cubic feet per minute of air flow (fume capture) to each hood, when the corresponding tap hole is being drilled or plugged.

(G) Number 2 bloom mill soaking pits. The soaking pits shall not operate after December 31, 1992.

(H) Prior to December 31, 1994, Inland Steel shall comply with a thirty percent (30%), six (6) minute average opacity limit for the electric arc furnace roof monitor. On and after December 31, 1994, Inland Steel shall comply with the roof monitor opacity limit specified in subsection (e). Prior to December 31, 1994, Inland Steel shall do the following:

- (i) Perform tests according to procedures developed in consultation with the department to establish process and control equipment operating procedures and to establish control system fan motor ampere and damper position or volumetric flow rates through each separately ducted hood and/or duct used to capture emissions during the electric arc furnace charging, tapping, and refining process.
- (ii) Install the required monitoring equipment in consultation with the department regarding its accuracy and precision position.
- (iii) Record the start time and duration of charging, tapping, and refining of each heat.

(I) After December 31, 1994, the sources shall comply with the respective limits contained in 326 IAC 6-1-10.1(d). The following mass emission limits will be applicable until December 31, 1994:

Inland Steel Processes	Emission Limit (Units)	Emission Limit (lbs/hr)
Number 6 coke battery underfire stack	0.271 lbs/to [sic., ton] coal	9.840
Number 7 coke battery underfire stack	0.267 lbs/ton coal	15.580
Number 9 coke battery underfire stack	0.406 lbs/ton coal	19.180
Number 10 coke battery underfire stack	0.371 lbs/ton coal	27.81
Stack serving 21 inch bar mill reheat furnace numbers 1 and 2	0.29 lbs/MMBtu	12.95
Number 4 slabber soaking pit numbers 1 through 18 collective	0.0 lbs/MMBtu	0.0
Number 4 slabber soaking pit numbers 19 through 45 collective	0.031 lbs/MMBtu	9.190
Number 3AC station boiler numbers 301 through 304	0.023 lbs/MMBtu	20.45
Number 3AC station boiler number 305	0.023 lbs/MMBtu	6.82

(6) The following for LTV Steel Corporation:

(A) Basic oxygen furnace facility roof monitor. The twenty percent (20%), three (3) minute average opacity standard in subsection (e) shall be achieved no later than December 10, 1993, and shall be maintained thereafter. Prior to December 10, 1993, the opacity standard shall be twenty percent (20%) except for one (1) three (3) minute average per hour.

(B) Number 4 blast furnace. Compliance with the opacity limit shall be achieved no later than February 1, 1994, and shall be maintained thereafter. Also, control equipment capable of capturing and collecting emissions generated at the east and west tilting runner spouts and tap holes shall be installed and operational by February 1, 1994.

(7) NIPSCO—Mitchell. Units 5 and 6 shall comply with the following:

(A) Thirty percent (30%), six (6) minute average opacity limit until December 31, 1992.

(B) Twenty-five percent (25%), six (6) minute average opacity limit from January 1, 1993, to December 10, 1993.

(C) Twenty percent (20%), six (6) minute average opacity limit after December 10, 1993.

(8) The following for USS—Gary Works:

(A) Numbers 15 and 16 coke batteries. The coke batteries and all associated operations shall no longer operate after the effective date of this section.

(B) Number 13 blast furnace casthouse roof monitor. The twenty percent (20%), six (6) minute average opacity standard shall be achieved no later than December 31, 1994, and shall be maintained thereafter.

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ter. Prior to December 31, 1994, the blast furnace casthouse shall comply with a thirty percent (30%) opacity, six (6) minute rolling average standard.

(C) Number 1 basic oxygen furnace facility roof monitor. The twenty percent (20%), three (3) minute average opacity standard in subsection (e) shall be achieved no later than December 31, 1996, and shall be maintained thereafter. Prior to December 31, 1996, the following opacity standards shall apply:

(i) Prior to January 1, 1995, the instantaneous opacity shall not exceed thirty percent (30%) opacity except for an aggregate of six (6) minutes per hour. Twenty-four (24) instantaneous opacity readings greater than thirty percent (30%) within any sixty (60) minute period shall be considered a six (6) minute aggregate.

(ii) For the period of January 1, 1995, through December 31, 1995, the instantaneous opacity shall not exceed twenty-five percent (25%) opacity, except for an aggregate of six (6) minutes per hour.

(iii) For the period of January 1, 1996, through December 30, 1996, the instantaneous opacity shall not exceed twenty-five percent (25%) opacity, except for an aggregate of five (5) minutes per hour. Twenty (20) instantaneous opacity readings greater than thirty percent (30%) within any sixty (60) minute period shall be considered a five (5) minute aggregate.

(D) Number 2 QBOP facility roof monitor. The twenty percent (20%), three (3) minute average opacity standard in subsection (e) shall be achieved no later than December 31, 1994, and shall be maintained thereafter. Prior to December 31, 1994, the instantaneous opacity shall not exceed thirty percent (30%) opacity except for an aggregate of eight (8) minutes per hour. Thirty-two (32) instantaneous opacity readings greater than thirty percent (30%) within any sixty (60) minute period shall be considered an eight (8) minute aggregate.

(E) Number 2 coke plant boilers. Only four (4) of the number 2 coke plant boilers may operate using coal or coke oven gas at the same time. If more than four (4) boilers are in operation, all but four (4) shall use natural gas.

(F) Eighty-four (84) inch hot strip mill. Actual heat input derived from coke oven gas and fuel oil shall not exceed a total of four hundred seventy-seven (477) million British thermal units per hour for waste heat boiler number 1 and furnace numbers 1 and 2 combined and a total of five hundred seven (507) million British thermal units per hour for waste heat boiler 2 and furnaces 3 and 4 combined. The remainder of the actual heat input shall be obtained by

burning natural gas. A total actual heat input shall not exceed four hundred forty (440) million British thermal units per hour for each furnace, one hundred seventy (170) million British thermal units per hour for waste heat boiler number 1, and two hundred (200) million British thermal units per hour for waste heat boiler number 2.

(G) Only two (2) of the three (3) sinter lines shall operate at any one (1) time. For each line, USS—Gary Works shall maintain the following records in regard to the sinter plant operation:

(i) Startup and shutdown time.

(ii) Average hourly production rate.

(iii) The cause of any malfunction and the correction taken.

(H) Number 2 coke plant boiler house boilers numbers 4, 5, and 6. A ninety (90) day written notice shall be given to the department and the U.S. EPA in the event of switching fuels from gas to coal. In addition, continuous opacity emission monitors must be installed prior to the fuel switch.

(I) Beach iron dumping and process vessel maintenance activities subject to subsection (p)(3)(F)(i) and (p)(3)(F)(ii) shall comply with the applicable twenty percent (20%) opacity limitation no later than December 31, 1994. The schedule for compliance submitted by December 10, 1993, shall establish milestones that achieve final compliance as soon as practical, but no later than December 31, 1994.

(J) Number 5 quench tower will comply with the ninety-five percent (95%) baffle requirement under section 10.2(c)(7)(F) of this rule no later than December 10, 1993.

(9) East Chicago Incinerator. The source shall comply with the mass emission limit in subsection (d) and the opacity limit in subsection (e) upon the schedule specified as a permit condition by the construction permit number CP 089-1744, ID 089-00309, issued by the department. These limits are in addition to complying with the requirements of the permit related to process and control equipment monitoring, compliance testing, stack continuous opacity monitoring, and other operating and maintenance requirements. Prior to the compliance date in this subdivision, the source shall comply with a mass emission limit of seventy-one hundredths (0.71) lbs of TSP/ton of raw material and a thirty percent (30%), six (6) minute average opacity limit.

(I) The continuous compliance plan (CCP) for sources listed in subdivisions (1) through (26), shall contain information on the facilities included in subsections (d) and (e). The following sources shall submit a CCP to the department by December 10, 1993:

(1) American Maize Products.

- (2) American Steel Foundry—East Chicago.
- (3) American Steel Foundry—Hammond.
- (4) Amoco Oil Company.
- (5) Atlas Blacktop.
- (6) Bucko Construction.
- (7) Commonwealth Edison Company.
- (8) East Chicago Incinerator.
- (9) General Refractory.
- (10) Globe Industries.
- (11) Hammond Lead Products—Halox, Halstab, and Lead.
- (12) Harbison Walker.
- (13) Inland Steel.
- (14) LTV Steel Corporation.
- (15) Lehigh Portland Cement.
- (16) Lever Brothers.
- (17) Marblehead Lime Company.
- (18) Marport Smelting.
- (19) National Recovery Systems.
- (20) NIPSCO—Mitchell.
- (21) Reed Minerals.
- (22) Rhone Poulenc.
- (23) U.S. Gypsum Company.
- (24) U.S. Reduction Company.
- (25) USS—Gary Works.
- (26) A CCP shall also be submitted by any source in Lake County for facilities that meet the following conditions:

(A) Boilers with heat input capacity equal to or greater than twenty-five (25) million British thermal units per hour, singly or in combination, that vent through a single stack. Facilities, including boilers and reheat furnaces, configured to burn only natural gas, blast furnace gas, or coke oven gas, or a combination of these gases, are exempt.

(B) Facilities that perform manufacturing operations in a building or structure such that the total uncontrolled PM_{10} emissions from all such operations amount to ten (10) tons per year or more and that could potentially escape into the atmosphere through roof vents and other openings. The uncontrolled PM_{10} emissions shall be estimated with AP-42, "Compilation of Air Pollutant Emission Factors, Volume I, (Stationary Point and Area Sources)", 4th Edition, September 1985, (and succeeding amendments)²² emission factors or other documentable emission factors acceptable to the commissioner.

(C) Each facility, not required to submit a CCP in accordance with this subsection, with uncontrolled PM_{10} or TSP emissions which may exceed one hundred (100) tons per year based on eight thousand seven hundred sixty (8,760) hours of operation and AP-42 emission factors or other documentable emission factors acceptable to the commissioner.

(m) The CCP shall contain, for the facilities specified in subsection (l), documentation of operation and maintenance practices of process operations and any particulate matter control equipment existing or required to be installed, replaced, or improved by subsection (k) that are essential to maintaining compliance with the mass and opacity limits specified in subsections (d) and (e) and 326 IAC 5-1.

(n) The CCP shall include the following:

- (1) A list of the processes and facilities at the source.
- (2) A list of the particulate matter control equipment associated with the processes and facilities listed in subsection (l).
- (3) The process operating parameters critical to continuous compliance with the applicable PM_{10} or TSP mass and opacity limits, including applicable specific requirements listed in subsection (p).
- (4) The particulate matter control equipment operating parameters critical to continuous compliance with the applicable PM_{10} or TSP mass and opacity including applicable requirements listed in subsection (q).
- (5) The specific monitoring, recording, and record keeping procedures for process and control equipment for each facility in the CCP specified in subdivisions (1) and (2).
- (6) The procedure used to assure that adequate exhaust ventilation is maintained through each duct at facilities where emissions are captured by a collection hood and transported to a control device.

(o) A CCP for a source to which subsection (k) applies shall contain a schedule for complying with the requirements of subsection (k). The schedule shall list specific compliance dates for the following actions:

- (1) Submittal of plans.
- (2) Start of construction.
- (3) Completion of construction.
- (4) Achieving compliance.
- (5) Performing compliance tests.
- (6) Submitting compliance test results.

(p) A source or facility to which subsection (l) applies, which belongs to any source category listed in this subsection, shall include the following information, applicable procedures, or commit to the following actions in its CCP:

- (1) For lime plants, monitor opacity at the kilns and control system vents during normal operation of the kiln with a continuous emission monitor or through self-monitoring of opacity. 40 CFR 60, Appendix A, Method 9²³ should be used to determine opacity if the facility is controlled by a positive pressure fabric filter.
- (2) For petroleum refineries, continuously monitor opacity of exhaust gases and monitor the coke burn-off rate in pounds per hour from fluid catalytic cracking

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unit catalyst regenerators.

(3) Steel mill CCPs shall include, as a minimum, the following:

(A) Basic oxygen process (BOP, BOF, QBOP), including the following:

(i) Describe the capture and control devices to control particulate emissions from each phase of the steel production cycle, including the furnace, hot metal transfer, hot metal desulfurization, and kish removal. The description shall include the locations within the facility of these operations in relation to capture hoods, control devices, roof vents, and other building openings.

(ii) Describe any fume suppression system, including the process or emission point being controlled, the location within the facility, the inert gas or steam application rate, and the monitoring method. As used in this item, "fume suppression system" means the equipment comprising any system used to inhibit the generation of emissions from steelmaking facilities with an inert gas, flame, or steam blanket applied to the surface of molten iron or steel.

(iii) Describe the procedure for recording furnace charging and tapping time, amount of throughput, and amount of steel produced.

(iv) Describe the off-gas system leak detection and repair record keeping practices.

(v) Describe the procedures used to minimize dirt and debris accumulation on the facility floor.

(vi) Describe practices that reduce PM₁₀ and TSP emissions escaping the primary or secondary hood during scrap charging and hot metal charging tapping steel and dumping slag.

(vii) At least monthly, inspect the operational status of the following elements of the capture system:

(AA) Pressure sensors.

(BB) Dampers.

(CC) Damper switches.

(DD) The hood and ductwork for the presence of holes.

(EE) Ductwork for accumulation of dust.

(FF) Fans for erosion.

Maintain records of the inspections and any repairs.

(B) Electric arc furnace, including the following:

(i) List the furnace operating sequences to be followed in case of multivessel operation. Describe the capture and control devices used to control particulate emissions in each phase of the steel production cycle, including exhaust rate and dampers, blast gates, instrumentation operation, and control. Include a drawing that shows:

(AA) the location of the furnace within the facility in relation to capture hoods and control devices, roof vents, and other building openings; and

(BB) the location of other processes within the facility that have potential to generate emissions, such as casting and ladle repair.

(ii) Describe the procedure for recording the following:

(AA) Time of furnace charging, furnace melting, and furnace refining.

(BB) Tapping start and stop times.

(CC) Charge weight for each heat.

(DD) Tap weight for each heat.

(iii) At least monthly, inspect the operational status of the following elements of the capture system:

(AA) Pressure sensors.

(BB) Dampers.

(CC) Damper switches.

(DD) Hood and ductwork for the presence of holes.

(EE) Ductwork for accumulation of dust.

(FF) Fans for erosion.

Maintain records of the inspections and any repairs.

(iv) Describe procedures used to minimize dirt and debris accumulation on the facility floor.

(v) Once per heat, either check and record the control system fan motor ampere and damper position or monitor flow rate through each separately ducted hood and/or duct used to capture emissions from the electric arc furnace operation.

(vi) Take visible emission readings of the direct shell evacuation system and the roof monitor at least once a day. The readings shall be taken during one (1) single steel production cycle and will be concurrent with the observations in subsection (k)(5)(G)(iii). The opacity observations shall be taken according to 40 CFR 60, Appendix A, Method 9^a and consist of at least one (1) six (6) minute observation each during charging and tapping and three (3) six (6) minute observations during melting and refining.

(vii) Report to the department on a quarterly basis control system fan motor amperage values that exceed fifteen percent (15%) of the value or operation at volumetric flow rates lower than those established during the performance test in subsection (k)(5)(G)(i). Operation above these values may be considered as unacceptable operation of the electric arc furnace equipment and the emissions capture and control system by the commissioner. Unless alternative values are established according

to the procedures prescribed in subsection (I).

(viii) Keep a record of any process and control equipment upsets, malfunctions, or activities within the electric arc furnace facility that may have resulted in excessive emissions. The records shall consist of the nature of event, time, and duration.

(C) Iron production that includes a blast furnace shall comply with the following:

(i) Describe procedures, including frequency, for inspection of the following elements of a capture system:

- (AA) Pressure sensors.
- (BB) Dampers.
- (CC) Damper switches.
- (DD) Hood and ductwork for the presence of holes.

Maintain records of the maintenance and any repairs made.

(ii) Describe procedures used to minimize dirt and debris accumulation on the facility floor.

(iii) Describe any fume suppression system, including the process or emission point being controlled, the location, and the inert gas or steam application rate and the monitoring method. Fume suppression system means the equipment comprising any system used to inhibit the generation of emissions from steelmaking facilities with an inert gas, flame, or steam blanket applied to the surface of molten iron or steel.

(iv) Describe the record keeping for the following elements of the iron production cycle:

- (AA) Time of hole drilling.
- (BB) Time of tapping.
- (CC) Time of hole plugging.

(v) Describe the blast furnace inspection, repair, and maintenance schedule for the following elements:

- (AA) Tuyres.
- (BB) Bleeder valves.
- (CC) Large and small bells.
- (DD) Uptakes and downcomers (to minimize backdrafting).
- (EE) Standby devices.

(vi) Describe the procedures used to inspect and operate the blast furnace gas cleaning equipment, such as dust catchers and scrubbing equipment to assure operation within design parameters.

(D) Sinter production shall comply with the following:

- (i) Describe routine startup and shutdown procedures and other work practices which are followed to reduce emissions and equipment malfunctions.
- (ii) Describe procedures for inspection of equipment to identify areas which may affect particulate

emissions, including the following:

- (AA) Points of wear.
- (BB) Distorted grate bars.
- (CC) Leaking machine seals.
- (DD) Holes in ducts.
- (EE) Holes in flapper valves.

(iii) Describe procedures for monitoring mechanical and electrical inspection records.

(iv) Describe procedures used to minimize dirt and debris accumulation on the facility floor.

(v) Describe procedures for monitoring burden parameters, including base to acid ratio and hydrocarbon content.

(vi) Describe the routine for plant operation during equipment failure, such as screening station failure.

(vii) At least monthly, inspect the operational status of the following elements of the capture system:

- (AA) Pressure sensors.
- (BB) Dampers.
- (CC) Damper switches.
- (DD) Hood and ductwork for the presence of holes.
- (EE) Ductwork for accumulation of dust.
- (FF) Fans for erosion.

Maintain records of the inspections and any repairs.

(E) Coke production shall comply with the following:

(i) Describe operating and maintenance practices used to minimize emissions from charging doors, charge port lids, offtakes, standpipes, gooseneck caps and gas collector mains, pushing, underfire stacks, and quenching, including quench water dissolved solids control. The documentation shall include the following operating practices:

- (AA) Use of jumper pipe during charging.
- (BB) Procedure for worker's coordination, training, and communication.
- (CC) Luting material used.
- (DD) Periodic engineering evaluations to determine improvements needed.
- (EE) Aspiration practices during charging, including aspiration rate and adjustment.

(ii) Describe the routinely available inventory of spare parts and equipment, including luting compounds, doors, and mobile scrubber cars.

(F) Waste disposal and recycling practices of iron and steel scrap and other metallic scrap shall comply with the following:

- (i) Provide a description of the routine activities involving disposal and reclamation of iron and steel. The visible emissions from such activities shall not exceed twenty percent (20%) opacity

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a three (3) minute average as measured by 40 CFR 60, Appendix A, Method 9^a. The opacity shall be determined as an average of twelve (12) consecutive observations recorded at fifteen (15) second intervals.

(ii) Maintenance of process vessels, for example, pugh ladles, shall be performed in enclosed structures. The visible emissions from such structures shall not exceed twenty percent (20%) opacity on a three (3) minute average as measured by 40 CFR 60, Appendix A, Method 9^a. The opacity shall be determined as an average of twelve (12) consecutive observations recorded at fifteen (15) second intervals.

(iii) Emissions from all steel scrap burning or cutting and oxygen lancing operations shall not exceed twenty percent (20%) opacity on a three (3) minute average as measured by 40 CFR 60, Appendix A, Method 9^a. The opacity shall be determined as an average of twelve (12) consecutive observations recorded at fifteen (15) second intervals.

(G) Visible emission evaluation plans shall comply with the following:

(i) Within sixty (60) days of the effective date of this section, each steel mill shall submit a plan to conduct visible emissions evaluations per the approved test method or procedures to determine compliance with the applicable opacity standard. The plan shall specify the frequency of visible emissions evaluations at the operations included in clauses (A) through (F). The plan shall include charging, pushing, lids and offtakes, doors, standpipes, and gas collector mains at coke production operations and lime plants.

(ii) If the plan specifies that the duration of readings is less than one (1) hour per day at each facility, the plan shall include the basis for less frequent evaluations.

(iii) The department shall disapprove the plan if it does not include all facilities or if the proposed duration and frequency will not provide for a reasonable assessment of compliance.

(iv) Upon approval of a steel mill's plan by the department, the visible emissions evaluations shall commence and the data submitted to the department within one (1) month of the end of the calendar quarter.

(v) The plan may be revised with department approval at any time.

(4) Fuel combustion boilers, as described in subsection (1)(26)(A), shall comply as follows:

(A) The requirements of this subdivision shall not relax the fuel monitoring and reporting requirements

of 326 IAC 7-1.1-1 for the sources this section applies to.

(B) Affected sources shall maintain records of the following information:

(i) Operational status of each facility for each day.

(ii) The daily measurements for each facility of the type of fuel used, amount of each type of fuel used, and heat content of each type of fuel used.

(iii) The TSP or PM₁₀ emission factors for each type of fuel to be used as estimated by the AP-42 or stack test method.

(iv) The method used to monitor the fuel amount and heat content in addition to the frequency.

(v) The control efficiency of the particulate control device and the method of determination.

(vi) Average daily PM₁₀ emissions (or TSP if applicable) for each facility, expressed in pounds per million British thermal units.

(C) The following guidance may be used to estimate emissions:

(i) For heat content Table A-3, "Typical Parameters of Various Fuels" AP-42, Volume 1, Fourth Edition, September 1985^a, or the latest edition.

(ii) For emission factors (TSP or PM₁₀), EPA 450/4-90-003, "AIRS Facility Subsystem Source Classification Codes and Emission Factors Listing for Criteria Air Pollutants"^a.

(iii) For control equipment efficiency, manufacturer's warranty or as determined by source.

(iv) Sources may substitute other site specific values for the values as indicated if they can be shown to be acceptable to the department.

(q) This subsection concerns particulate matter control equipment operation and maintenance requirements. A CCP shall provide that the following control equipment related information will be maintained at the source's property and will be available for inspection by department personnel:

(1) Startup, shutdown, and emergency shutdown procedures.

(2) Sources shall notify the department fifteen (15) days in advance of startup of either new control equipment or control equipment to which major modifications have been made.

(3) Manufacturer's recommended inspection procedures, preventive and corrective maintenance procedures, and safety devices and procedures, such as sensors, alarm systems, and bypass systems. If manufacturer's recommendations are not available, procedures shall be developed by the source.

(4) Contents of the operator's training program and the frequency with which the training is held.

- (5) A list of spare parts available at the facility.
- (6) A list of control equipment safety devices, for example, high temperature sensors and alarm systems, exhaust gas stream bypass system, or safety interlock system.
- (7) Monitoring and recording devices and/or instruments to monitor and record control equipment operating parameters specified in subsection (n)(4).

(r) Particulate matter control equipment operation, recording, and inspection procedure requirements shall be as follows:

- (1) A CCP for a facility controlled with a baghouse shall include the recording, inspection, and maintenance procedures to be consistent with the requirements of subsection (m), such as the following:

- (A) Operating parameters, such as the following:
 - (i) Pressure drop across the baghouse.
 - (ii) Gas flow rate at baghouse inlet.
 - (iii) Gas temperatures at inlet.

A CCP shall identify the monitors and instrumentation, and their location, accuracy, precision, and calibration frequency. A CCP shall also include a description of any visible emission evaluation program.

(B) Baghouse cleaning system. A complete description of the cleaning system, including such information as intensity, duration, frequency, and method of activation.

(C) Baghouse inspection and maintenance schedule. The inspection schedule logs or records shall be available for inspection by the department for up to one (1) year after the date of inspection. The inspection shall include the activities and frequency of the activities. A source may request an alternative schedule based on manufacturer's recommendations or alternatives documented by the company. The revised schedule must be approved by the department. Inspections shall include the following:

- (i) Daily inspections shall include the following:
 - (AA) Pressure drop.
 - (BB) Fan amperage.
 - (CC) Cleaning cycle.
 - (DD) Compressed air on pulse jet baghouses for values outside of the operating ranges.
 - (EE) Dust discharge equipment for proper operation.
 - (FF) General check for abnormal audible and visual conditions.
- (ii) Weekly inspections of the following:
 - (AA) Moving parts on discharge system.
 - (BB) Bypass and isolation damper operation.
 - (CC) Bag tension.
 - (DD) Compressed air lines, oilers, and filters.

- (EE) Manometer lines.
- (FF) Temperature indicating equipment.
- (GG) Bag cleaning sequence.
- (HH) Drive components on fans.

- (iii) Monthly inspections of the following:

- (AA) Bag seating condition.
- (BB) Moving parts on shaker baghouses.
- (CC) Fan corrosion and blade wear.
- (DD) Hoses and clamps.
- (EE) Bags for leaks and holes.
- (FF) Bag housing for corrosion.

- (iv) Quarterly inspections of the following:

- (AA) Bags.
- (BB) Ducts for dust build-up.
- (CC) Damper valves for proper setting.
- (DD) Door gaskets.
- (EE) Baffle plate for wear.

- (v) Annual inspection of the following:

- (AA) Welds and bolts.
- (BB) Hoppers for wear.
- (CC) Cleaning parts for wear.

- (2) A CCP for a facility controlled by an electrostatic precipitator (ESP) shall include recording, inspection, and maintenance procedures to be consistent with the requirements of subsection (m), such as the following:

- (A) Operating parameters, such as the following:

- (i) Gas flow rate.
- (ii) Temperature.
- (iii) Type and rate of gas conditioning agents used for resistivity control or resistivity measurements.
- (iv) Power input at each section of the ESP. A CCP shall identify monitors and instrumentation and specify location, accuracy, precision, and calibration frequency. A CCP shall also include a description of any visible emissions evaluation program.

(B) ESP inspection and maintenance schedule. The inspection schedule logs or records shall be available for inspection by the department for up to one (1) year after the date of inspection. The inspection shall include the activities and frequency of the activities. A source may request an alternative schedule based on manufacturer's recommendations or alternatives documented by the company. The revised schedule must be approved by the department. Inspections shall include the following:

- (i) Daily inspection of the following:

- (AA) Fan amperage.
- (BB) Temperature.
- (CC) Gas conditioning agent flow rate or resistivity.
- (DD) Electrical readings for values outside the operating range.
- (EE) Hoppers and dust discharge system for

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proper operation.

(FF) Transformer-rectifier enclosures and bus ducts for abnormal arcing.

Corrective actions taken, if any, shall be recorded.

(ii) Weekly inspection of the following or as per manufacturer's recommendations:

(AA) Rapper operation.

(BB) Control set interiors.

(iii) Monthly inspection of the following:

(AA) Fans for noise and vibration.

(BB) Hopper heaters.

(CC) Hopper level alarm operation.

(iv) Quarterly inspection of the following:

(AA) Check rapper and vibrator switch contacts.

(BB) Access door dog bolt and hinges.

(CC) Interlock covers.

(DD) Test connectors.

(EE) Exterior for visual signs of deterioration.

(FF) Abnormal vibration, noise, and leaks.

(v) Semiannual inspection of the following, or as per manufacturer's recommendations:

(AA) T-R liquid and surge arrestor spark gap.

(BB) Conduct internal inspection.

(CC) Top housing or insulator compartment and all electrical insulating surfaces, and correct any defective alignment.

(vi) Annual inspection of the following:

(AA) Tightness of all electrical connections.

(BB) Operation of switchgear.

(CC) Rapper insulator connections.

(DD) Observe and record areas of corrosion.

(3) A CCP for a facility controlled by a scrubber shall include the recording, inspection, and maintenance procedures to be consistent with the objectives of subsection (m), such as the following:

(A) Operating parameters, such as the following:

(i) Gas flow rate.

(ii) Inlet and outlet temperatures of gas to and from scrubber.

(iii) Liquid flow rate to scrubber.

(iv) Pressure drop across scrubber.

(v) Ph of liquid to scrubber.

(vi) Fan and pump currents.

A CCP shall specify the location, accuracy, precision, and calibration frequency of monitors and instrumentation.

(B) Scrubber inspection and maintenance schedule.

The inspection schedule logs or records shall be available for inspection by the department for up to one (1) year after the date of inspection. The inspection shall include the activities and frequency of the activities. A source may request an alternative schedule based on manufacturer's recommendations

or alternatives documented by the company. The revised schedule must be approved by the department. Inspections shall include the following:

(i) Daily inspection of the following:

(AA) Scrubbing liquid flow rates to scrubber.

(BB) Pressure drop across scrubber.

(CC) Fan and pump amperages for values outside the operating range.

Corrective actions taken shall be recorded.

(ii) Monthly inspection of the following:

(AA) Seals for abrasion.

(BB) Corrosion and leaks.

(CC) Fans for abrasion, corrosion, and solids build-up.

(DD) Pipes for abrasion, corrosion, and plugging.

(EE) Throat wear in the venturi scrubber.

(FF) Sensors, alarm systems, and bypass devices for proper operation.

(GG) Entrainment separator for blockage.

(HH) Spray nozzles for plugging or excessive wear.

(s) The department shall review the CCP. The department may at any time request, in writing, any of the following:

(1) A CCP to be revised to include additional documentation or practices as needed to allow the department to verify that operation and maintenance practices critical to continuous compliance with the applicable mass and opacity limits are being followed.

(2) A compliance test to be conducted with the compliance test methods specified in this section if the department determines that the procedures specified in the CCP are not being followed or are inadequate to assure continuous compliance. The compliance test may consist of a series of opacity measurements of frequency and duration specified by the department or a stack test. The department may request that information be collected during the test to determine proper operation and maintenance procedures needed to assure continuous compliance with applicable mass and opacity limits.

(t) The source shall respond, in writing, within thirty (30) days of a request per subsection (s). The source shall either provide an expeditious schedule, not to exceed sixty (60) days, for providing the information requested by the department or petition the department for an alternative to the request. A schedule for completion of an opacity compliance test shall not exceed thirty (30) days from the department's request. A source may petition the department for an alternative schedule based on practical problems in meeting the request.

(u) The source shall update the CCP, as needed, retain

a copy of any changes and updates to the CCP on the property, and make the updated CCP available for inspection by the department. The source shall submit the updated CCP, if required, to the department within thirty (30) days of the update.

(v) Failure to submit a CCP, maintain all information required by the CCP on plant property, or submit a required update to a CCP is a violation of this section. Failure to respond to a request by the department under subsection (s) is a violation of this section. The department may notify a source in writing of noncompliance with an action or procedure specified within a CCP and require that the source conduct a compliance test. If the compliance test demonstrates noncompliance with the applicable particulate matter or opacity limit, both the findings of noncompliance of the CCP and the compliance test shall be considered as violations of the applicable mass or opacity limit. A violation of an applicable particulate matter or opacity limit of this section, based either on a compliance test performed by the source or by observations or tests conducted by the department, is a violation of this section.

* Copies of the Code of Federal Regulations have been incorporated by reference and are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 or the Indiana Department of Environmental Management, Office of Air Management.

** Copies of AP-42 and supplements are available for purchase from the U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711 or can be reviewed at the Indiana Department of Environmental Management, Office of Air Management.

*** Copies of the EPA guidance documents are available from the U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711 or the Indiana Department of Environmental Management, Office of Air Management. (*Air Pollution Control Board; 326 IAC 6-1-10.1; filed May 12, 1993, 11:30 a.m.: 16 IR 2368*)

SECTION 13. 326 IAC 6-1-10.2 IS ADDED TO READ AS FOLLOWS:

326 IAC 6-1-10.2 Lake County PM₁₀ coke battery emission requirements

Authority: IC 13-1-1-4; IC 13-7-7
Affected: IC 13-1-1; 13-7

Sec. 10.2. (a) The provisions of this section shall apply to those sources located in Lake County which include a coke battery.

(b) The following definitions shall apply to this section:

326 IAC 1-2-10	"Charging" definition
326 IAC 1-2-11	"Charge port" definition
326 IAC 1-2-16	"Coke oven battery" definition
326 IAC 1-2-17	"Coke oven topside" definition
326 IAC 1-2-18	"Coke-side" definition
326 IAC 1-2-31	"Gas collector main" definition
326 IAC 1-2-32.1	"Gooseneck cap" definition
326 IAC 1-2-35	"Larry car" definition
326 IAC 1-2-34.1	"Jumper pipe" definition
326 IAC 1-2-49	"Offtake piping" definition
326 IAC 1-2-50	"Oven door" definition
326 IAC 1-2-60	"Pushing" definition
326 IAC 1-2-61	"Push-side" definition
326 IAC 1-2-62.1	"Quench car" definition
326 IAC 1-2-63	"Quenching" definition
326 IAC 1-2-63.1	"Quench reservoir" definition
326 IAC 1-2-63.2	"Quench tower" definition
326 IAC 1-2-77	"Standpipe lid" definition
326 IAC 1-2-87	"Underfire" definition.

(c) With the exceptions noted in this subsection, the coke batteries in Lake County shall comply with the following emission limits by December 10, 1993:

(1) Single-pass cap for oven door emissions. No visible emissions shall be permitted from more than ten percent (10%) of the observed coke oven doors on any coke oven battery. The number of coke-side doors and push-side doors shall be counted in determining compliance with this emission limit. Doors of ovens which are out of service, either temporarily or permanently, shall not be counted. A push door and a chuck door shall be counted as one (1) door. Compliance with this emission limit shall be determined in accordance with the procedure described in 326 IAC 11-3-4(c).

(2) Charging emissions. No visible emissions shall be permitted from the charging system for more than cumulative total of one hundred twenty-five (125) seconds during five (5) consecutive charging periods. For the purpose of this subdivision, "charging system" means the equipment required to add coal to a coke battery. This includes a larry car, charge ports, jumper pipe, and offtake pipe. Compliance with this emission limit shall be determined in accordance with the procedure contained in 326 IAC 11-3-4(a).

(3) Pushing emissions. The following emission limits shall apply during pushing operations:

(A) The opacity of emissions from the coke-side of oven to be pushed, before the first movement of coke from the oven to the coke car begins, shall exceed twenty percent (20%). The opacity shall be determined on an instantaneous basis at the top of the battery. The observer shall be positioned out of the quench car rails.

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- (B) The opacity of emissions during the pushing operation shall not exceed twenty percent (20%). The pushing operation shall be considered to begin with the first movement of coke from the oven into the coke car and to end when the quench car enters the quench tower. The opacity shall be determined using 40 CFR 60, Appendix A, Method 9*, except that the readings shall be taken at fifteen (15) second intervals. Six (6) consecutive readings shall be averaged to determine the opacity. The observer shall only use those backgrounds that are above the elevation of the battery surface. If this condition cannot be met for six (6) consecutive readings, then the opacity shall be determined using the lesser number of consecutive readings.
- (C) The particulate emissions from the control device stack shall not exceed four-hundredths (0.04) pounds per ton of coke pushed. Compliance with this emission limit shall be determined by 40 CFR 60, Appendix A, Method 5*.
- (4) Charge port lid emissions. No visible emissions shall be permitted from more than three percent (3%) of the total charge port lids on operating ovens of a coke oven battery. Compliance with this emission limit shall be determined in accordance with 326 IAC 11-3-4(b).
- (5) Offtake piping emissions. No visible emissions shall be permitted from more than five percent (5%) of the total offtake piping on any coke oven battery. At no time shall the visible emissions from any gooseneck cap opening exceed twenty percent (20%). An exclusion from this opacity limit shall be allowed for two (2) minutes after a gooseneck cap is opened. The opacity shall be determined on an instantaneous basis. Compliance with this emission limit shall be determined in accordance with 326 IAC 11-3-4(b).
- (6) Gas collector main emissions. No visible emissions shall be permitted from the gas collector main. Compliance with this emission limit shall be determined in accordance with 326 IAC 11-3-4(e). Caps on the main shall be exempt from this requirement during maintenance.
- (7) Quenching emissions at USS. At a minimum, the following procedures and practices shall be followed:
- (A) The quench water, as applied to the coke, shall not exceed one thousand five hundred (1,500) milligrams per liter dissolved solids.
- (B) One (1) fifty (50) milliliter aliquot sample of quench water will be collected during each quenching operation at each quenching location by an automatic sampling system and composited into a refrigerated container. At the end of a twenty-four (24) hour sampling period, a composite sample consisting of a total of eighty-five (85) to two hundred (200) aliquots, depending upon the number of quenches performed, will have been collected at each location. The composite sample will be mixed and a representative sample obtained for analyses. The composite quench water sample from each location shall be analyzed using Method 2540C as found in Standard Methods for the Examination of Water and Wastewater, 17th Edition, published by the American Public Health Association**.
- (C) The automatic sampling system will draw fifty (50) milliliter aliquots from the header which feeds process water to the quench tower reservoirs during each quenching operation.
- (D) The source shall submit results of the quench water analysis monthly to the office of air management.
- (E) A source shall submit the following information regarding its quenching operation in its CCP required to be submitted by section 10.1(i) of this rule:
- (i) The source of quench water, for example, Lake Michigan water only, or a mixture of Lake Michigan water, spent quench water, and process water.
- (ii) The volume of quench water and the proportion of each source of water.
- (F) All coke oven towers shall be equipped with baffles. Baffles shall cover ninety-five percent (95%) or more of the cross-sectional area of the exhaust vent or stack for straight quench towers and must be maintained in operable condition. For offset quench towers numbers 2 and 3 at USSteel, the number and arrangement of baffles in the tower shall be maintained as designed. The source shall submit quench tower drawings showing baffle arrangement to the department and the U.S. EPA on or before December 10, 1993. Compliance with the quench tower baffle requirement shall be determined by comparison of the number and arrangement of baffles with the submitted plans.
- (8) Underfire emissions requirements shall be as follows:
- (A) Particulate emissions from underfire stacks shall be limited by the emission limitations contained in section 10.1(d) of this rule.
- (B) Visible emissions from underfire stacks shall comply with the requirements set forth in 326 IAC 5-1-2.
- (9) Precarbonization emissions requirements shall be as follows:
- (A) Particulate emissions from precarbonization towers shall be limited by the emission limitations contained in section 10.1(d) of this rule.
- (B) Visible emissions from precarbonization towers shall comply with the requirements set forth in 326 IAC 5.
- (d) The coke batteries at Inland Steel, in lieu of subsec-

tion (c)(3), (c)(5), and (c)(8) above, shall comply with the requirements of section 10.1(k)(5)(D) of this rule.

* Copies of the Code of Federal Regulations have been incorporated by reference and are available from the Government Printing Office, Washington, D.C. 20402 or the Indiana Department of Environmental Management, Office of Air Management.

** These documents have been incorporated by reference and are available from the Indiana Department of Environmental Management, Office of Air Management, 105 South Meridian Street, Indianapolis, Indiana 46225. (*Air Pollution Control Board; 326 IAC 6-1-10.2; filed May 12, 1993, 11:30 a.m.: 16 IR 2391*)

SECTION 14. 326 IAC 6-1-11.1 IS ADDED TO READ AS FOLLOWS:

326 IAC 6-1-11.1 Lake County fugitive particulate matter control requirements

Authority: IC 13-1-1-4; IC 13-7-7
Affected: IC 13-1-1; IC 13-7

Sec. 11.1. (a) This section applies to the following:

(1) Facilities and operations at a source having the potential to emit five (5) tons per year fugitive particulate matter into the atmosphere in Lake County:

- (A) Paved roads and parking lots.
- (B) Unpaved roads and parking lots.
- (C) Material transfer.
- (D) Wind erosion from storage piles and exposed areas.
- (E) Material transportation activities.
- (F) Material processing facilities with capacity equal to or greater than ten (10) tons per hour. The mass and opacity limits for emissions in this section are not applicable to such facilities specifically listed in section 10.1 of this rule. However, fugitive emissions from such facilities are subject to this section.
- (G) Dust handling equipment.
- (H) Any other facility or operation with a potential to emit fugitive particulate matter and not included in this subsection.

(2) The following sources located in Lake County:

- (A) A. Metz.
- (B) Amoco Oil, Whiting Refinery.
- (C) Beemsterboer Slag & Ballast Corporation.
- (D) Breslube U.S.A.
- (E) Bucko Construction.
- (F) Caine Steel.
- (G) Commonwealth Edison Company.
- (H) Dietrich Industries.
- (I) General Transportation.
- (J) Great Lakes Industrial Center.

- (K) Illiana Warehousing.
- (L) Industrial Scrap.
- (M) Inland Steel Corporation.
- (N) Lehigh Portland Cement.
- (O) LTV Steel Corporation.
- (P) Marblehead Lime Company.
- (Q) Mid Continental Coal & Coke Company.
- (R) NIPSCO—Mitchell.
- (S) Ozinga Brothers.
- (T) Reed Minerals.
- (U) Shell Oil.
- (V) Union Carbide, Linde SP Gas.
- (W) Union Carbide, Oxygen Plant.
- (X) Union Tank Car Co.
- (Y) USS—Gary Works.
- (Z) Wolf Lake Terminal.
- (AA) X Rail Systems.

(3) New sources required to be registered or permitted under 326 IAC 2-1, with total uncontrolled PM₁₀ fugitive particulate matter emissions equal to or greater than five (5) tons per year.

(4) The independent contractors, companies, and corporations performing byproduct processing recycling activities, waste disposal, or any other activities that may result in uncontrolled PM₁₀ emissions of five (5) tons per year or more.

(5) Any subsequent owner or operator of a source or facility covered by this subsection.

(b) The amount of uncontrolled PM₁₀ emissions emitted from a facility or source shall be determined by applying the method contained in "Compilation of Air Pollutant Emission Factors", Volume 1: Stationary Point and Area Sources, AP-42 Fourth Edition, September 1985*.

(c) The following definitions apply throughout this section:

- (1) "Affected facilities" means the sources of fugitive emissions listed in subsection (a).
- (2) "Batch transfer" means transfer of material onto or out of storage piles by front end loaders, trucks, or cranes.
- (3) "Capacity" means the sum of all throughputs to the first introduction point of all the processing lines on a plant property.
- (4) "Capture system" means the equipment used to capture and transport particulate matter generated by one (1) or more process equipment to a control device including enclosures, hoods, ducts, fans, and dampers.
- (5) "Continuous transfer" means transfer of material onto or out of storage piles by conveyor.
- (6) "Control device" means the air pollution control equipment used to reduce particulate matter emissions released to the atmosphere.

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- (7) "Dust handling equipment" means the equipment used to handle dust collected by control equipment, such as, but not limited to, a conveyor used to transfer dust from a control equipment hopper to a temporary storage container. A truck is an example of a temporary storage container. Both a conveyor and temporary storage container, in this case, are dust handling equipment.
- (8) "Exposed areas" means unused areas on plant property that cannot be defined as a paved or unpaved road or parking lot, storage pile, or associated area that have the potential to emit particulate emissions by wind action.
- (9) "Fugitive particulate matter" means any particulate matter emitted into the atmosphere other than through a stack.
- (10) "Inplant transportation" means transportation of material on plant transportation routes, such as railroads and plant roads, in equipment such as trucks, railroad cars, front end loaders, conveyors, and skip hoists. The inplant transportation might be from one (1) process to another, from process equipment to waste disposal and reclamation sites, or from one (1) storage pile to another. This includes, for example, hauling of slag from slag pits to the slag processing facility on the plant property.
- (11) "Material" means raw process material, byproduct, intermediate product, waste product, final product, and dust collected by control equipment, having proportion of loose, dry dust equal to or greater than five-tenths percent (0.5%) as measured by the ASTM C-136 method²², having potential to emit particulate emissions when disturbed by transfer, processing, and transportation activities defined in this section. Material may include the following:
- (A) Sand.
 - (B) Limestone.
 - (C) Coal.
 - (D) Gypsum.
 - (E) Slag.
 - (F) Gravel.
 - (G) Clay.
 - (H) Cement.
 - (I) Ores.
 - (J) Grain.
- (12) "Material processing facilities" means the equipment, or the combination of different types of equipment, used to process material for use in the plant or for commercial sale. The following sources are examples of these types of facilities:
- (A) Power generation plants.
 - (B) Portland cement manufacturing plants.
 - (C) Asphalt concrete manufacturing plants.
 - (D) Concrete manufacturing plants.
 - (E) Lime manufacturing plants.
 - (F) Iron and steel manufacturing plants, which include blast furnaces and basic oxygen furnaces.
- (G) Sinter plants.
 - (H) Coal and coke preparation plants.
 - (I) Slag processing plants.
 - (J) Brick manufacturing plants.
 - (K) Grain processing elevators.
 - (L) Food and feed manufacturing plants.
- Equipment includes initial crusher, screen, grinder, mixer, dryer, belt conveyor, bucket elevator, bagging operation, storage bin, and truck or railroad car loading station.
- (13) "Material transfer" means the transfer of material from process equipment onto the ground, from the ground into hauling equipment, from hauling equipment onto a storage pile, from a storage pile into hauling equipment for transport, or into an initial hopper for further processing. Dumping of slag from blast furnaces or basic oxygen furnaces into the slag pits and subsequent transfer to the hauling vehicle and initial hopper at the slag processing facility is an example of material transfer.
- (14) "Paved road" means an asphalt or concrete surfaced thoroughfare or right-of-way designed or used for vehicular traffic.
- (15) "Processing line" means material processing equipment connected by a conveying system. This does not include transfer from a conveyor to a storage pile.
- (16) "Silt content" means the mass of an aggregate sample smaller than seventy-five (75) microns in diameter as determined by dry sieving. Silt content may be determined by using the procedures in AP-42 Supplement, "Silt Analysis Procedures", Appendix C-3, September 1988²³.
- (17) "Stack emissions" means the particulate matter that is released to the atmosphere from a confined opening like the exit of a control device or a chimney.
- (18) "Storage pile" means any outdoor storage on a source's property of material as defined in subdivision (11).
- (19) "Surface silt loading" means the mass of loose surface dust on a paved road, per length of road, as determined by dry vacuuming. Surface silt loading may be determined by using the procedures specified in the U.S. EPA guideline document U.S. EPA 600/2-79-103, "Iron and Steel Plant Open Source Fugitive Emission Evaluation", Appendix B²⁴.
- (20) "Transfer point" means a point in a conveying operation where the material is transferred to or from a belt conveyor, except where the material is being transferred to a storage pile.
- (21) "Unpaved road" means a thoroughfare or right-of-way other than a paved road designed or used for vehicular traffic.
- (22) "Vent" means an opening through which there is

mechanically induced airflow for the purpose of exhausting air carrying particulate matter emissions from one (1) or more items of material processing equipment from a building.

(d) The following are particulate matter emission limitations:

(1) Paved roads and parking lots. The average instantaneous opacity of fugitive particulate emissions from a paved road shall not exceed ten percent (10%). A source shall implement the control measures specified by subsection (e)(3)(F) within twenty-four (24) hours after notification by the department or the U.S. EPA of violating the average instantaneous opacity limit. A violation of the instantaneous average opacity limits in this subsection is a violation of the rule. In addition, when requested by the department or the U.S. EPA after an exceedance of the opacity limit is observed by a representative of either agency, the source shall initiate a compliance check with the surface silt loading limit. The department may require a revision of the control plan under subsection (e)(8), if the test shows an exceedance of the surface silt loading limit. The average instantaneous opacity shall be the average of twelve (12) instantaneous opacity readings, taken for four (4) vehicle passes, consisting of three (3) opacity readings for each vehicle pass. The three (3) opacity readings for each vehicle pass shall be taken as follows:

- (A) The first will be taken at the time of emission generation.
- (B) The second will be taken five (5) seconds later.
- (C) The third will be taken five (5) seconds later or ten (10) seconds after the first.

The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand approximately fifteen (15) feet from the plume and at approximately right angles to the plume. Each reading shall be taken approximately four (4) feet above the surface of the roadway or parking area.

(2) Unpaved roads and parking lots. The average instantaneous opacity of fugitive particulate emissions from an unpaved road shall not exceed ten percent (10%). The department may request a revision of the control plan pursuant to subsection (e)(8), if an observation shows an exceedance of the average instantaneous opacity limit. This revision may be in lieu of, or in addition to, pursuing an enforcement action for a violation of the limit. Average instantaneous opacity shall be determined according to the procedure described in subdivision (1). The fugitive particulate emissions from unpaved roads shall be controlled by the implementation of a work program and work practice under the control plan required in subsection (e).

(3) Material transfer limits shall be as follows:

(A) The average instantaneous opacity of fugitive particulate emissions from batch transfer shall not exceed ten percent (10%). The average instantaneous opacity shall consist of the average of three (3) opacity readings taken five (5) seconds, ten (10) seconds, and fifteen (15) seconds after the end of one (1) batch loading or unloading operation. The three (3) readings shall be taken at the point of maximum opacity. The observer shall stand approximately fifteen (15) feet from the plume and at approximately right angles to the plume.

(B) Where adequate wetting of the material for fugitive particulate emissions control is prohibitive to further processing or reuse of the material, the opacity shall not exceed ten percent (10%) three (3) minute average. This includes material transfer to the initial hopper of a material processing facility as defined in subsection (c) or material transfer for transportation within or outside the source property including, but not limited to, the following:

(i) Transfer of slag product for use by asphalt plants:

(AA) from a storage pile to a front end loader; and

(BB) from a front end loader to a truck.

(ii) Transfer of sinter blend for use at the sinter plant:

(AA) from a storage pile to a front end loader;

(BB) from a front end loader to a truck; and

(CC) from a truck to the initial processing point.

(iii) Transfer of coal for use at a coal processing line:

(AA) from a storage pile to a front end loader; and

(BB) from a front end loader to the initial hopper of a coal processing line.

Compliance with any operation lasting less than three (3) minutes shall be determined as an average of consecutive observations recorded at fifteen (15) second intervals for the duration of the operation.

(C) Slag and kish handling activities at integrated iron and steel plants shall comply with the following particulate emissions limits:

(i) The opacity of fugitive particulate emissions from transfer from pots and trucks into pits shall not exceed twenty percent (20%) on a six (6) minute average.

(ii) The opacity of fugitive particulate emissions from transfer from pits into front end loaders and from transfer from front end loaders into truck shall comply with the fugitive particulate emission limits in subdivision (9).

(4) The opacity of fugitive particulate emissions from

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continuous transfer of material onto and out of storage piles shall not exceed ten percent (10%) on a three (3) minute average. The opacity shall be determined using 40 CFR 60, Appendix A, Method 9***. The opacity readings shall be taken at least four (4) feet from the point of origin.

(5) Wind erosion from storage piles and exposed areas. The opacity of fugitive particulate emissions from storage piles shall not exceed ten percent (10%) on a six (6) minute average. These limitations may not apply during periods when application of fugitive particulate control measures are either ineffective or unreasonable due to sustained very high wind speeds. During such periods, the company must continue to implement all reasonable fugitive particulate control measures and maintain records documenting the application of measures and the basis for a claim that meeting the opacity limitation was not reasonable given prevailing wind conditions. The opacity shall be determined using 40 CFR 60, Appendix A, Method 9***, except that the opacity shall be observed at approximately four (4) feet from the surface at the point of maximum opacity. The observer shall stand approximately fifteen (15) feet from the plume and at approximately right angles to the plume. The opacity of fugitive particulate emissions from exposed areas shall not exceed ten percent (10%) on a six (6) minute average. The opacity shall be determined using 40 CFR 60, Appendix A, Method 9***.

(6) Material transportation activities shall include the following:

(A) There shall be a zero (0) percent frequency of visible emission observations of a material during the inplant transportation of material by truck or rail at any time. Material transported by truck or rail that is enclosed and covered shall be considered in compliance with the inplant transportation requirement. Compliance with this limitation shall be determined by 40 CFR 60, Appendix A, Method 22***, except that the observation shall be taken at approximately right angles to the prevailing wind from the leeward side of the truck or railroad car.

(B) The opacity of fugitive particulate emissions from the inplant transportation of material by front end loaders and skip hoists shall not exceed ten percent (10%). Compliance with this limitation shall be determined by the average of three (3) opacity readings taken at five (5) second intervals. The three (3) opacity readings shall be taken as follows:

(i) The first will be taken at the time of emission generation.

(ii) The second will be taken five (5) seconds later.

(iii) The third will be taken five (5) seconds later or ten (10) seconds after the first.

The three (3) readings shall be taken at the point of

maximum opacity. The observer shall stand at least fifteen (15) feet from the plume approximately and at right angles to the plume. Each reading shall be taken approximately four (4) feet above the surface of the roadway or parking area.

(7) Material processing facilities shall include the following:

(A) The PM₁₀ stack emissions from a material processing facility shall not exceed twenty-two thousandths (0.022) grains per dry standard cubic foot and ten percent (10%) opacity. Compliance with the concentration limitation shall be determined using the test methods found in section 10.1(f) of this rule. Compliance with the opacity limitation shall be determined by 40 CFR 60, Appendix A, Method 9***.

(B) The opacity of fugitive particulate emissions from a material processing facility, except crusher at which a capture system is not used, shall not exceed ten percent (10%). Compliance with this limitation shall be determined by 40 CFR 60, Appendix A, Method 9***.

(C) The opacity of fugitive particulate emissions from a crusher at which a capture system is not used shall not exceed fifteen percent (15%). Compliance with this limitation shall be determined by 40 CFR 60, Appendix A, Method 9***.

(D) There shall be a zero (0) percent frequency of visible emission observations from a building enclosing all or a part of the material processing equipment, except from a vent in the building. Compliance with this standard shall be determined by 40 CFR 60, Appendix A, Method 22***.

(E) The PM₁₀ emissions from building vents shall not exceed twenty-two thousandths (0.022) grains per dry standard cubic foot and ten percent (10%) opacity. Compliance with the concentration standard shall be determined by 40 CFR 60, Appendix A, Method 5 or 17, and with the opacity standard by 40 CFR 60, Appendix A, Method 9***.

(8) Dust handling equipment. The opacity of particulate emissions from dust handling equipment shall not exceed ten percent (10%). Compliance with this standard shall be determined by 40 CFR 60, Appendix A, Method 9***.

(9) Any facility or operation not specified in this subsection shall meet a twenty percent (20%), three (3) minute opacity standard. Compliance with this limitation shall be determined by 40 CFR 60, Appendix A, Method 9***, except that the opacity standard shall be determined as an average of twelve (12) consecutive observations recorded at fifteen (15) second intervals. Compliance of any operation lasting less than three (3) minutes shall be determined as an average of consecutive observations recorded at fifteen (15) second intervals for the duration of the operation.

(e) Control plans shall include the following:

(1) Within six (6) months of the effective date of this section, a source to which this section applies shall submit a control plan which, when fully implemented, will achieve compliance with the applicable emission limitations stated in subsection (d). Failure to submit a control plan in accordance with this section shall be considered a violation of this rule. A control plan shall also be included as part of a construction permit application pursuant to 326 IAC 2-1.

(2) A control plan, upon submittal to the department, shall become part of a source's operating permit or registration conditions.

(3) The following information:

(A) The name and address of the source and location, if the source is located on another source's property.

(B) The name and address, if different from that of the source, of the owner or operator responsible for the execution of the plan.

(C) Identification of the facilities or operations listed in subsection (a)(1) and those affected by section 10.1 of this rule that exist at the source.

(D) A map showing the location of all unpaved roads, paved roads, parking lots, storage piles, material processing facilities, dust handling equipment, material transfer points, and waste disposal and reclamation sites.

(E) A full description of the facilities on the map, including the following information, where applicable:

(i) The road lengths and widths, average daily traffic, surface silt loading, classification of vehicle traffic, and other data necessary to estimate PM_{10} emissions from paved and unpaved roads and parking lots.

(ii) A description of each storage pile, including the type of material in the pile, its moisture content, the silt content, the throughput, and the equipment used to load onto and load out of the storage piles.

(iii) A complete description of the material processing facilities on the plant property, including a material flow diagram of the processing lines, the rated capacity of each piece of equipment, and the existing control equipment and their efficiencies, including the process equipment served.

(iv) A complete description of the material transfer, implant transportation, and dust handling equipment. Material transfer operations shall include, at a minimum, those operations contained in subsection (c)(13).

(v) A complete description of all other fugitive particulate matter emitting facilities not covered in this clause.

(F) The description of the proposed control measures and practices that the source will employ to achieve compliance with the emission limitations and data that prove its effectiveness.

(G) A list of the conditions that will prevent control measures and practices from being applied and alternative control practices and measures that will achieve compliance with the emission limitations.

(H) A schedule for achieving compliance with the provisions of the control plan. The schedule shall specify the time required to award necessary contracts and the time required to begin and complete construction and installation. Final compliance shall be achieved no later than December 10, 1993.

(4) The source shall keep the following documentation to show compliance with each of its control measures and control practices:

(A) A map or diagram showing the location of all emission sources controlled, including the location, identification, length, and width of roadways.

(B) For each application of water or chemical solution to roadways, the following shall be recorded:

(i) The name and location of the roadway controlled.

(ii) Application rate.

(iii) Time of each application.

(iv) Width of each application.

(v) Identification of each method of application.

(vi) Total quantity of water or chemical used for each application.

(vii) For each application of chemical solution, the concentration and identity of the chemical.

(viii) The material data safety sheets for each chemical.

(C) For application of physical or chemical control agents not covered by clause (B), the following:

(i) The name of the agent.

(ii) Location of application.

(iii) Application rate.

(iv) Total quantity of agent used.

(v) If diluted, percent of concentration.

(vi) The material data safety sheets for each chemical.

(D) A log recording incidents when control measures were not used and a statement of explanation.

(E) Copies of all records required by this section shall be submitted to the department within twenty (20) working days of a written request by the department.

(F) The records required under this subdivision shall be kept and maintained for at least three (3) years and shall be available for inspection and copying by department representatives during working hours.

(G) A quarterly report shall be submitted to the department stating the following:

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- (i) The dates any required control measures were not implemented.
- (ii) A listing of those control measures.
- (iii) The reasons that the control measures were not implemented.
- (iv) Any corrective action taken.

This report shall be submitted to the department thirty (30) calendar days from the end of a quarter. Quarters end March 31, June 30, September 30, and December 31.

(5) A source shall consult "Compilation of Air Pollutant Emission Factors", Volume 1: Stationary Point and Area Sources, AP-42 Fourth Edition, September 1985* and Control of Open Sources of Fugitive Dust, U.S. EPA, September 1988** to determine the following:

(A) The information needed.

(B) The effectiveness of the applicable control practices and measures.

(6) A source listed under subsection (a)(2) shall be exempt from this section if it can demonstrate to the department that its uncontrolled PM₁₀ emissions are less than five (5) tons per year. An exemption must be approved by both the department and by the U.S. EPA as a revision to the state implementation plan.

(7) The evaluation of a control plan by the department and U.S. EPA or a request for exemption from the requirement to submit a control plan shall be based on the following criteria:

(A) The completeness of the description of the affected facilities located on the plant property.

(B) The accuracy of the methods and procedures used to determine the applicability of the section.

(C) The completeness of the description of control measures and practices proposed by the source and any alternative control measures, and the accuracy of the data and calculations which document compliance with the emission limitations.

(D) The completeness of the data recording protocol for determining compliance with the control measures and practices.

(8) The department may require that a source revise its control plan if either of the following apply:

(A) A test of surface silt loading on a paved road shows that the loading is greater than one hundred (100) pounds per mile averaged over five (5) roads or five (5) road sections. The surface silt loading shall be determined using the sampling and analysis procedures in the U.S. EPA guidance document EPA 600/2-79-103, "Iron and Steel Plant Open Source Fugitive Emission Evaluation", Appendix B**.

(B) The department's evaluation under subdivision (7) determines that the requirements of the control plan have not been met.

* Copies of AP-42 and supplements are available for

purchase from the U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711 or can be reviewed at the Indiana Department of Environmental Management, Office of Air Management.

** Copies of the EPA guidance documents are available from the U.S. EPA, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711 or the Indiana Department of Environmental Management, Office of Air Management.

*** Copies of the Code of Federal Regulations have been incorporated by reference and are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402 or the Indiana Department of Environmental Management, Office of Air Management. (*Air Pollution Control Board; 326 IAC 6-1-11.1; filed May 12, 1993, 11:30 a.m.; 16 IR 2393*)

SECTION 15. 326 IAC 11-3-2 IS AMENDED TO READ AS FOLLOWS:

326 IAC 11-3-2 Emission limitations

Authority: IC 13-1-1-4; IC 13-7-2-10; IC 13-7-7

Affected: IC 13-1-1-1; IC 13-1-1-4; IC 13-7-1-1; IC 13-7-7-2

Sec. 2. (a) Precarbonization emissions requirements shall be as follows:

(1) Particulate emissions from precarbonization towers shall be limited by the emission limitations determined pursuant to under 326 IAC 6-1.

(2) Visible emissions from any precarbonization unit shall comply with the requirements set forth in 326 IAC 5-1.

(b) Visible emissions from the charging system, including any open charge port, offtake system, mobile jumper pipe, or Larry car shall be limited as follows:

(1) On and after July 1, 1979, such emissions shall not be visible for more than a cumulative total of two hundred (200) seconds during five (5) consecutive charging periods.

(2) On and after July 1, 1980, such emissions shall not be visible for more than a cumulative total of one hundred seventy-five (175) seconds during five (5) consecutive charging periods.

(3) On and after July 1, 1981, such emissions shall not be visible for more than a cumulative total of one hundred fifty (150) seconds during five (5) consecutive charging periods.

(4) On and after July 1, 1982, such emissions shall not be visible for more than a cumulative total of one hundred twenty-five (125) seconds during five (5) consecutive charging periods.

(5) One (1) charge out of twenty (20) consecutive charges shall be exempt from the total seconds of charging emissions using the procedures set forth in 326 IAC 11-3-4(a), section 4(a) of this rule.

(c) Charge port lid emissions requirements shall be as follows:

- (1) On and after July 1, 1979, no visible emissions shall be permitted from more than ten percent (10%) of the total charge port lids on any coke oven battery.
- (2) On and after July 1, 1980, no visible emissions shall be permitted from more than seven percent (7%) of the total charge port lids on any coke oven battery.
- (3) On and after July 1, 1981, no visible emissions shall be permitted from more than five percent (5%) of the total charge port lids on any coke oven battery.
- (4) On and after July 1, 1982, no visible emissions shall be permitted from more than three percent (3%) of the total charge port lids on any coke oven battery.

(d) Offtake piping emissions requirements shall be as follows:

- (1) On and after July 1, 1979, no visible emissions shall be permitted from more than thirty percent (30%) of the total offtake piping on any coke oven battery.
- (2) On and after July 1, 1980, no visible emissions shall be permitted from more than twenty-five percent (25%) of the total offtake piping on any coke oven battery.
- (3) On and after July 1, 1981, no visible emissions shall be permitted from more than twenty percent (20%) of the total offtake piping on any coke oven battery.
- (4) On and after July 1, 1982, no visible emissions shall be permitted from more than ten percent (10%) of the total offtake piping on any coke oven battery.
- (5) On and after December 10, 1993, no visible emissions shall be permitted from more than five percent (5%) of the total offtake piping on any coke oven battery within Lake County.

(e) Gas collector main emissions requirements shall be as follows:

- (1) On and after July 1, 1979, no visible emissions shall be permitted from more than eight (8) points on the gas collector main, excluding the connection with the standpipes.
- (2) On and after July 1, 1980, no visible emissions shall be permitted from more than six (6) points on the gas collector main, excluding the connection with the standpipes.
- (3) On and after July 1, 1981, no visible emissions shall be permitted from more than five (5) points on the gas collector main, excluding the connection with the standpipes.
- (4) On and after July 1, 1982, no visible emissions shall be permitted from more than three (3) points on the gas collector main, excluding the connection with the standpipes.
- (5) On and after December 10, 1993, no visible emissions shall be permitted from the gas collector main on any coke oven battery within Lake County.

(f) Oven door emissions requirements shall be as follows:

- (1) On and after July 1, 1979, no visible emissions shall be

permitted from more than twenty-five percent (25%) of the total coke oven doors, plus four (4) doors, on any coke oven battery.

(2) On and after July 1, 1980, no visible emissions shall be permitted from more than twenty percent (20%) of the total coke oven doors, plus four (4) doors, on any coke oven battery.

(3) On and after July 1, 1981, no visible emissions shall be permitted from more than fifteen percent (15%) of the total coke oven doors, plus four (4) doors, on any coke oven battery.

(4) On and after July 1, 1982, no visible emissions shall be permitted from more than ten percent (10%) of the total coke oven doors, plus four (4) doors, on any coke oven battery.

(5) On and after December 10, 1993, no visible emissions shall be permitted from more than ten percent (10%) of the observed coke oven doors on any coke oven battery within Lake County.

(g) Pushing emissions requirements shall be as follows:

(1) All coke oven batteries shall be equipped with a device capable of capturing and collecting coke-side particulate matter such that the effluent gas emissions contain no more than four-hundredths (0.04) gram per two (2.0) kilogram of coke pushed. (0.04 lb/ton).

(2) Such device shall be designed and operated in compliance with an operating permit to collect ninety percent (90%) of the pushing emissions. If the construction and design of the device has been approved by the commissioner by granting the permit, the device, if operated properly in compliance with the permit conditions, will be assumed to be collecting ninety percent (90%) of the pushing emissions. Said The permit shall be submitted to U.S. EPA as a SIP revision.

(h) Quenching emissions requirements shall be as follows:

(1) Quench towers serving existing coke oven batteries for which construction commenced prior to June 19, 1979, shall not have visible emissions from the quenching of coke with the direct application of water to hot coke unless quenching is conducted under a tower equipped with efficient baffles to impede the release of particulates into the atmosphere. Efficient baffles are baffles taking the form of slats, louvers, screens, or other impediments placed in a configuration within a quench tower to force a change of direction and reduction of velocity of the steam plume to aid in the reduction of particulate matter emitted.

(2) The quench water makeup must contain a total dissolved solids content of no more than one thousand five hundred (1,500) milligrams per liter. If an individual facility source is required to comply with conflicting Indiana water pollution control requirements, the commissioner may revise quenching requirements of this part subsection on a case

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by-case basis. Prior to granting or denying such a revision, the commissioner shall consider the following factors:

- (A) The total estimated particulate emissions from the quenching operation of the facility or source at the time the petition is filed.
- (B) The amount of reduction in particulate emissions which would be realized if the source were required to comply with the requirements of this subsection. ~~(b)(1)~~ of this section;
- (C) The net increase in pollutant loadings to any receiving waters which would result from measures needed to comply with this subsection. ~~(b)(1)~~ of this section;
- (D) The net overall environmental effect of requiring the facility or source to comply with this subsection. ~~(b)(1)~~ of this section;
- (E) The costs which will necessarily be incurred by the facility or source to comply with this subsection. ~~(b)(1)~~ of this section.

(i) Underfire particulate and sulfur dioxide emissions requirements shall be as follows:

- (1) Particulate and sulfur dioxide emissions from underfire stacks shall be limited by the emission limitations determined pursuant to under 326 IAC 6-1, 326 IAC 6-2, and 326 IAC 7-1, 326 IAC 7-1.1, respectively.
- (2) Visible emissions from any underfire stack shall comply with the requirements set forth in 326 IAC 5-1.

(Air Pollution Control Board; 326 IAC 11-3-2; filed Mar 10, 1988, 1:20 p.m.; 11 IR 2549; filed May 12, 1993, 11:30 a.m.; 16 IR 2398)

SECTION 16. 326 IAC 11-3-4 IS AMENDED TO READ AS FOLLOWS:

326 IAC 11-3-4 Compliance determination

Authority: IC 13-1-1-4; IC 13-7-2-10; IC 13-7-7

Affected: IC 13-1-1-1; IC 13-1-1-4; IC 13-7-1-1; IC 13-7-7-2

Sec. 4. (a) This subsection applies to charging emissions. To determine compliance with 326 IAC 11-3-2(b), section 2(b) of this rule, observations shall be made and the identity recorded from any point or points on the topside of a coke oven battery such that the observer can obtain an unobstructed view of the charging operation. The observer shall keep cumulative time of the total number of seconds charging emissions are visible. Time is started when a visible emission appears and is stopped when the visible emission expires. This procedure shall continue throughout the entire charging period. Visible emissions occurring simultaneously from two (2) or more separate points shall be timed as one (1). The following shall not be timed:

- (1) Visible emissions from burning coal spilled on the top of the oven or oven lids during charging.
- (2) Visible emissions from any equipment other than the charging system or charge ports.

- (3) Visible emissions from standpipes during charging.
- (4) Visible emissions from the charge port lids and the standpipe on the oven most recently charged.
- (5) Visible emissions from coke oven doors which may be wind-blown across the topside of a coke oven battery.
- (6) Visible emissions due to steam from uncombined water.

The time retained is the total time visible emissions are observed during a charge and shall be recorded on a data sheet. If the observations of a consecutive set of five (5) charges are interrupted by an event not in the control of the observer, e.g., for example, momentary interference by a passing quench car plume, then the data for the interrupted charge(s) shall be discarded and additional consecutive charges shall be observed. Five (5) charges observed as such shall be treated as consecutive charges. To determine compliance with 326 IAC 11-3-2(b)(5), section 2(b) of this rule, the observer shall discard the data for the charge observed, during each set, which contains the greatest cumulative total number of seconds during which emissions are visible. A set shall consist of the total number of consecutive charges read by the observer during any one (1) observation period, but in no event shall a set exceed twenty (20) consecutive charges.

(b) Topside emissions requirements shall be as follows:

- (1) To determine compliance with topside emission limitations in 326 IAC 11-3-2(e) and (4), section 2(c) and 2(d) of this rule, the observer shall walk the length of the topside of a coke oven battery, on a line down the middle of the battery, or as close to as safety permits, recording to record the identity of standpipes in a single traverse and charge port lids in a single traverse having that have any visible emissions. The following shall not be counted:

(A) Visible emissions from burning coal spilled on the top of the oven or oven lids.

(B) Visible emissions from charge port lids and standpipe lids, from a maximum of three (3) ovens, that are opened during a decarbonization period or charging period.

(C) Visible emissions from the standpipe on an oven being charged.

(D) Visible emissions resulting from maintenance work.

(E) Visible emissions from steam caused by the vaporization of wet luting material.

(F) Visible emissions due to steam from uncombined water.

(2) Visible emissions from charge port lids shall include all emissions from the charge port casting/lid interface.

(3) Visible emissions from the offtake piping assembly shall include the following:

(A) Any leaks from cracks and/or defects in the piping itself.

(B) Any leaks coming from the flanged joints of any pipes, including the final joint with the collector main.

(C) Any leaks coming from the standpipe base.

(D) Leaks coming from the standpipe lid or along its seal with the standpipe.

(E) Any leaks from the offtake piping assembly which are not contained in one (1) of the above categories in this subdivision.

(c) This subsection applies to oven door emissions. To determine compliance with 326 IAC 11-3-2(f), section 2(f) of this rule, the observer shall record the starting time of his the inspection, then shall move steadily along the push-side or coke-side of a coke oven battery stopping only to record the identity of any doors having of ovens not temporarily or permanently taken out of service that have visible emissions, but not including visible emissions due to steam from uncombined water. any doors obstructed from the observers view, and The inspector shall have any of the following options:

- (1) To wait for any doors which are blocked from the inspector's view to become unobstructed.
- (2) To continue the inspection and return when the view of the doors becomes unobstructed.
- (3) To exclude the obstructed doors from the calculation of the total number of doors observed.

The finishing time of that inspection shall be recorded followed by the inspector repeating the same procedure on the opposite side of the same battery. The observer shall maintain a consistent distance of no less than twenty-five (25) and no more than one hundred (100) feet from the face of the coke oven door. inspector shall be positioned either outside of the quench car tracks on the coke-side of the battery or outside of the push-side bench. After a brief scan of a coke oven door, the observer shall proceed in his the inspection checking each succeeding door in a like manner.

(d) Testing to determine the amount of particulate matter emitted from any facility subject to a grain loading or process weight limitation of this rule (326 IAC 11-3-2) shall be conducted in accordance with the procedures set forth in 40 CFR 60, Appendix A, Methods 1-5*, or other equivalent procedures approved by the commissioner.

(e) Gas Collector Main Emissions: To determine compliance with gas collector main emission limitations in 326 IAC 11-3-2(e), section 2(e) of this rule, the observer shall walk the length of the topside of the gas collector main, recording to record the number of points in a single traverse from which emissions are visible.

* Copies of the Code of Federal Regulations have been incorporated by reference and are available from the Government Printing Office, Washington, D.C. 20402 or the Indiana Department of Environmental Management, Office of Air Management. (Air Pollution Control Board; 326 IAC 11-3-4; filed Mar 10, 1988, 1:20 p.m.: 11 IR 2550; filed May 12, 1993, 11:30 a.m.: 16 IR 2400)

SECTION 17. THE FOLLOWING ARE REPEALED: 326 IAC 5-1-6; 326 IAC 6-1-10; 326 IAC 6-1-11.

LSA Document #92-163(F)

Proposed Rule Published: October 1, 1992; 16 IR 108

Hearing Held: October 22, 1992

Approved by Attorney General: May 7, 1993

Approved by Governor: May 11, 1993

Filed with Secretary of State: May 12, 1993, 11:30 a.m.

Incorporated Documents Filed with Secretary of State: 40 CFR 51, Appendix M; 40 CFR 60, Appendix A; construction permit number CP 089-1744, ID 089-00309 for East Chicago Incinerator; Method 2540C, Standard Methods for the Examination of Water and Wastewater, 17th Edition, published by the American Public Health Association; ASTM Designation: C 136 - 84a, Standard Method for Sieve Analysis of Fine and Coarse Aggregates; U.S. EPA 600/2-79-103, "Iron and Steel Plant Open Source Fugitive Emission Evaluation", Appendix B; Control of Open Sources of Fugitive Dust, U.S. EPA, September 1988.

TITLE 345 INDIANA STATE BOARD OF ANIMAL HEALTH

LSA Document #93-24(F)

DIGEST

Amends 345 IAC 3-4-1 and 345 IAC 3-4-17 to conform to current requirements in IC 15-2.1 and to require a swine herd infected with swine Brucellosis to depopulate as directed by the Indiana state board of animal health. Adds 345 IAC 3-4-19 concerning validated Brucellosis-free status. Effective 30 days after filing with the secretary of state.

345 IAC 3-4-1

345 IAC 3-4-17

345 IAC 3-4-19

SECTION 1. 345 IAC 3-4-1 IS AMENDED TO READ AS FOLLOWS:

345 IAC 3-4-1 Scope of rule

Authority: IC 15-2.1-3-19

Affected: IC 15-2.1-3-13; IC 15-2.1-10

Sec. 1. A Regulation This rule is established under Indiana Code, Title 15, Article 2, Chapter 6, and Title 15, Article 2, Chapter 3, Section 31, IC 15-2.1-10 providing for the Brucellosis testing of breeding swine imported into the state of Indiana or sold through public or private sale within the State of Indiana. This Regulation rule also provides for the

3745-17-07

Control of visible particulate emissions from stationary sources.

(A)

Visible particulate emission limitations for stack emissions:

(1) General limitations:

(a) Except as otherwise specified in paragraphs (A)(1)(b), (A)(2) and (A)(3) of this rule, visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average.

(b) Except as otherwise specified in paragraphs (A)(2) and (A)(3) of this rule, visible particulate emissions from any stack may exceed twenty per cent opacity, as a six-minute average, for not more than six consecutive minutes in any sixty minutes, but shall not exceed sixty per cent opacity, as a six-minute average, at any time.

(2) It shall be deemed not to be a violation of this rule where the presence of uncombined water is the only reason for failure of a stack emission to meet the requirements of this rule.

(3) The visible particulate emission limitations established in paragraph (A)(1) of this rule shall not apply to the following:

(a) The start-up of the following fuel burning equipment:

(i) For any fuel burning equipment which are equipped with baghouses or electrostatic precipitators, until the exhaust gases have achieved a temperature of two hundred fifty degrees Fahrenheit at the inlet of the baghouses or electrostatic precipitators, provided that the director may incorporate a higher start-up temperature in the permit or variance for such source for which an applicant demonstrates to the satisfaction of the director that the higher temperature is needed for safety considerations or to prevent damage to the control equipment; and

(ii) For any fuel burning equipment which are uncontrolled or which are equipped solely with mechanical collectors (including mechanical separators or similar devices) for the control of particulate emissions, for a period of not more than three hours from the moment of start-up, provided that the director may incorporate a longer start-up time period in the permit or variance for such source for which an applicant demonstrates to the satisfaction of the director that the longer time period is required.

- (b) The shutdown of the following fuel burning equipment:
- (i) For any fuel burning equipment which are equipped with baghouses or electrostatic precipitators, after the temperature of the exhaust gases has dropped below two hundred fifty degrees Fahrenheit at the inlet of the baghouses or electrostatic precipitators, provided that the director may incorporate a higher shutdown temperature in the permit or variance for such source for which an applicant demonstrates to the satisfaction of the director that the higher temperature is needed for safety considerations or to prevent damage to the control equipment; and
 - (ii) For any fuel burning equipment which are uncontrolled or which are equipped solely with mechanical collectors (including mechanical collectors which are equipped with sidestream separators or similar devices) for the control of particulate emissions, for a period of not more than three hours, provided that the director may incorporate a longer shutdown time period in the permit or variance for such source for which an applicant demonstrates to the satisfaction of the director that the longer time period is required.
- (c) The malfunction of any air contaminant source or the malfunction/shutdown of air pollution control equipment associated with any air contaminant source, if the owner or operator of said air contaminant source or air pollution control equipment complies with the requirements of rule 3745-15-06 of the Administrative Code and none of the conditions listed in paragraph (C) of rule 3745-15-06 of the Administrative Code exists;
- (d) Intermittent soot-blowing operations (the cleaning of heat transfer surfaces with pressurized air or steam) for fuel burning equipment which are uncontrolled or which are equipped solely with mechanical collectors (including mechanical collectors which are equipped with sidestream separators or similar devices) for the control of particulate emissions, provided that the owner or operator of such fuel burning equipment maintains a daily record which clearly documents the date, beginning time and ending time for all intermittent soot-blowing operations;
- (e) Salt glazing operations conducted in a gas-fired periodic brick or tile kiln, for a period of not more than two hours during any twenty-one consecutive days of operation of said kiln;

- (f) Intermittent ash removal operations (the dumping or pulling of ash) for fuel burning equipment which are uncontrolled or which are equipped solely with mechanical collectors (including mechanical collectors which are equipped with sidestream separators or similar devices) for the control of particulate emissions, provided that the owner or operator of such fuel burning equipment maintains a daily record which clearly documents the date, beginning time and ending time for all intermittent ash removal operations;
- (g) The commencement of increased coal firing from a banked condition for fuel burning equipment, for a period not to exceed thirty minutes;
- (h) Any air contaminant source which is not subject to the requirements of paragraphs (B)(3) and (B)(4) of rule 3745-17-08 of the Administrative Code, or rule 3745-17-09, 3745-17-10 or 3745-17-11 of the Administrative Code; and
- (i) Any air contaminant source for which an equivalent visible particulate emission limitation has been established by the director pursuant to paragraph (C) of this rule.

(B) Visible particulate emission limitations for fugitive dust:

- (1) Except as provided in paragraphs (B)(2) to (B)(7) of this rule, visible particulate emissions from any fugitive dust source shall not exceed twenty per cent opacity as a three-minute average.
- (2) Visible particulate emissions from the fugitive dust sources associated with a coke oven battery shall not exceed any of the following:
 - (a) There shall be no visible particulate emissions from any charging operations except for a period of time not to exceed one hundred twenty-five seconds during any five consecutive charges. One charge, which represents the charge with the highest visible particulate emissions value of twenty consecutive charges observed, may be exempted from this visible particulate emission limitation.
 - (b) At no time shall there be visible particulate emissions from more than ten per cent of the offtake piping.
 - (c) At no time shall there be visible particulate emissions from more than five per cent of the charging hole lids.

- (d) For visible particulate emissions from oven doors:
- (i) For the Still coke oven battery (OEPA source number B919) at the "Armco Steel Company, L.P., Middletown Works" (OEPA premise number 1409010006), located on Crawford street, Middletown, Ohio, at no time shall there be visible particulate emissions from more than sixteen per cent of the oven doors.
 - (ii) For all other coke oven batteries, at no time shall there be visible particulate emissions from more than ten per cent of the oven doors. Two oven doors, which represent the last oven charged prior to the commencement of visible particulate emission readings performed in accordance with paragraph (B)(2)(c) of rule 3745-17-03 of the Administrative Code, shall be exempted from this visible emission limitation.
 - (iii) For purposes of this paragraph, an oven door and the associated chuck door on the pusher side of the battery shall be considered as one door.
- (e) Visible particulate emissions from any pushing operations shall not exceed twenty per cent opacity read above the battery top. For purposes of this paragraph, the duration of a pushing operation shall commence with the moving (or pushing) of the coke mass from an oven and shall conclude when the quench car enters the quench tower.
- (3) Visible particulate emissions of fugitive dust from electric arc furnace shop roof monitors, argon-oxygen decarburization shop roof monitors, blast furnace casthouses and sintering operations shall not exceed twenty per cent opacity as a six-minute average.
 - (4) There shall be no visible particulate emissions from any paved roadway or parking area except for a period of time not to exceed six minutes during any sixty-minute observation period.
 - (5) There shall be no visible particulate emissions from any unpaved roadway or parking area except for a period of time not to exceed thirteen minutes during any sixty-minute observation period.
 - (6) There shall be no visible particulate emissions from any material storage piles except for a period of time not to exceed thirteen minutes during any sixty-minute observation period.

- (7) The visible particulate emission limitations specified in paragraphs (B)(1) to (B)(6) of this rule shall not apply to the following:
- (a) Ship loading spouts at grain terminals;
 - (b) Blasting at mineral extraction operations;
 - (c) Blowing taps, poling and oxygen lancing of the tap hole and casting operations associated with ferroalloy electric arc furnaces;
 - (d) Any fugitive dust source which is exempted from the requirements of paragraph (B) of rule 3745-17-08 of the Administrative Code;
 - (e) Any fugitive dust source which is not located within the geographical areas specified in Appendix A of rule 3745-17-08 of the Administrative Code, unless the director, in accordance with paragraph (A)(2) of rule 3745-17-08 of the Administrative Code, requires the owner or operator to submit and implement a control program which will bring the fugitive dust source into compliance with the requirements of paragraph (B) of rule 3745-17-08 of the Administrative Code; and
 - (f) The malfunction of any air contaminant source or the malfunction/shutdown of air pollution control equipment associated with any air contaminant source, if the owner or operator of said air contaminant source or air pollution control equipment complies with the requirements of rule 3745-15-06 of the Administrative Code and none of the conditions listed in paragraph (C) of rule 3745-15-06 of the Administrative Code exists.
- (8) It shall be deemed not to be a violation of this rule where the presence of uncombined water is the only reason for failure of a fugitive dust emission to meet the requirements of this rule.

(C) Equivalent visible particulate emission limitations:

- (1) For the purpose of establishing an equivalent visible particulate emission limitation, any owner or operator of an air contaminant source which is subject to the requirements of paragraph (A)(1) of this rule may request the director to determine the average opacity of the emissions from said source during any performance test(s) conducted pursuant to paragraph (B) of rule 3745-17-03 of the Administrative Code. Any such request shall be made in writing at the time the test specifications and procedures are submitted to the director pursuant to paragraph (B)(6) of rule 3745-17-03 of the Administrative Code.

- (2) If, upon review of such owner's or operator's written report of the results of the performance test(s), it is the director's judgment that the air contaminant source is in compliance with all applicable emission limitations for which the performance tests were conducted, but fails to comply with the requirements of paragraph (A)(1) of this rule, the director shall notify the owner or operator as expeditiously as practicable that he may request the director to establish an equivalent visible particulate emission limitation for the source. Such request shall be made in writing within thirty days following receipt of the notification from the director.
- (3) Any written request for an equivalent visible particulate emission limitation from an owner or operator of an air contaminant source shall include information which demonstrates the following:
 - (a) That the performance tests were conducted in accordance with the conditions and procedures accepted by the director pursuant to paragraph (B)(6) of rule 3745-17-03 of the Administrative Code; and
 - (b) That the air contaminant source and any associated air pollution control equipment were operated and maintained in a manner so as to minimize the opacity of the emissions during the performance test(s).
- (4) If an owner or operator of an air contaminant source complies with the requirements of paragraphs (C)(1) to (C)(3) of this rule, the director may establish an equivalent visible particulate emission limitation for said source. Any such equivalent visible particulate emission limitation shall be specified in the terms and conditions of the permit, variance or order issued by the director for said source.
- (D) Any revision approved by the director in accordance with paragraphs (A)(3)(a)(i), (A)(3)(a)(ii), (A)(3)(b)(i), (A)(3)(b)(ii), and (C)(4) of this rule shall not revise the federally enforceable requirements of the state implementation plan until approved by the U.S. environmental protection agency.

Effective: June 14, 1991

Promulgated under: RC Chapter 119
 Rule amplifies: RC Chapter 3704
 Prior effective dates: February 15, 1972,
 June 18, 1980, October 1, 1983

1 *Final*

EXHIBIT 4

RECEIVED
CLERK'S OFFICE

SEP 29 1995

STATE OF ILLINOIS
POLLUTION CONTROL BOARD

BEFORE THE POLLUTION CONTROL BOARD

STATE OF ILLINOIS

SPECTRULITE CONSORTIUM, INC.,

Petitioner,

-vs-

NO. PCB 96-006

ILLINOIS ENVIRONMENTAL
PROTECTION AGENCY,

Respondent.

Hearing held, pursuant to Notice, on the 20th day
of September, 1995, at the hour of 10:30 a.m., at 600
South Second Street, Suite 402, Springfield, Illinois,
before Mr. Michael L. Wallace, duly appointed Hearing
Officer.

TRANSCRIPT OF PROCEEDINGS

1 on the one line limitation?

2 A. To start up the facility, normally if we --
3 if we were able to operate straight, we would have one
4 start-up at the start of a week. The constraint that
5 we're put on to operate only one pot line requires us
6 to shut one down and start up maybe two or three times
7 back and forth in a week to allow us to do that. And
8 each time it costs us approximately ten to twelve
9 hours or 7200. So you're looking at three times that
10 number.

11 Q. 21,000?

12 A. For a start-up.

13 Q. For a week? A week? Is that what it is?

14 A. That can be typical but depending on our
15 production schedule, that number can move back and
16 forth. It is --

17 Q. So it's 71 -- is it 7100 dollars per
18 start-up?

19 A. 7200 dollars, yes.

20 Q. 72.

21 A. And it is -- in one week if we have a long
22 run or something it would be that. But it can -- we
23 can have the switches back and forth to meet
24 production and scheduled delivery of product.

ILLINOIS EPA 12-8-93

RE AMERICAN STEEL

CHARLES A. RUUD	ASF	312-258-5482
EDWARD T. BROSIUS	ASTED	312-419-4442
JAMES R. CYGANOWICZ	ASF	618-452-2111
JAMES R. KIELTY	ASF	618-452-2111
BERKLEY L. MOORE	IEPA	217 524-4948
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Jeff Benbenek	"	618/346-5120
MATTHEW L. WILL	IEPA	217-524-4789
ROB KALEEL	IEPA	217/524-4387
DENNIS LAWLER	IEPA	217/782-1830

Sign-up U 7cc

EXHIBIT 5b

1 P17-10 Reg. Mtg. - IEPA & Steel Group 2/10/84

Name	Affiliation	Telephone #
Jeff Benbenek	Ill EPA - FOS	618/346-5120
Jack Doctores	IEPA - DLC	(217) 524-3332
BEAKLEY MOORE	IEPA - AIR PLANNING	217 524-4948
Jim Ross	IEPA - Permits	(217) 785-0768
MIKE THOMAS	LTV STEEL	219 391 2840
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DAVE ZIBBLE	Acme Steel	708 - 849 - 2500
JAMES T. HARRINGTON	Ross & Hardies ILL. Steel Group	312-750-8619
CARL CANNON	GRANITE CITY STEEL	618-451-3013
Larry Siebenborger	Granite City Steel	618-451-3391
JACK HEINTZ	NATIONAL STEEL	219-273-7343
Dennis Lawler	IL EPA	217-782-1830
Rob Kaeel	IL EPA	217-782-1830

SIGN-IN SHEET

7/26/94

RACHEL DOCTOR
BERKLEY MOORE
ROB KALEEL
DENNIS LAWLER
Jeff Benbenek
BOB SISTER
MIKE THOMAS
DAVE ZIBBLE
J. T. HARRINGTON
Larry Sibenburger
Jim Ross

IEPA 217/524/5553
IEPA 217 524 444
IEPA
"
"

LTV STEEL CO. (216) 429-6477
LTV STEEL (219) 391-2840
ACME STEEL 108-849-7500
ROSS & Handies/Trg
312 7508619
Granite City Steel 618-451-3391
IEPA (217) 785-0768

efficient at sampling conditions or use a standard pitot with a known coefficient in a configuration with the EGR sampling assembly such that flow disturbances are minimized.

4.1.2.2 Construct a setup of pressure drops for various Ap's and temperatures. A computer is useful for these calculations. An example of the output of the EGR setup program is shown in Figure 6 of this method, and directions on its use are in section 4.1.5.2 of this method. Computer programs, written in IBM BASIC computer language, to do these types of setup and reduction calculations for the EGR procedure, are available through the National Technical Information Services (NTIS), Accession number PB90-500000, 5285 Port Royal Road, Springfield, VA 22161.

4.1.2.3 The EGR setup program allows the tester to select the nozzle size based on anticipated average stack conditions and prints a setup sheet for field use. The amount of recycle through the nozzle should be between 10 and 80 percent. Inputs for the EGR setup program are stack temperature (minimum, maximum, and average), stack velocity (minimum, maximum, and average), atmospheric pressure, stack static pressure, meter box temperature, stack moisture, percent O₂, and percent CO₂ in the stack gas, pitot coefficient (C_p), orifice ΔH₀, flow rate measurement calibration values [slope (m) and y-intercept (b) of the calibration curve], and the number of nozzles available and their diameters.

4.1.2.4 A less rigorous calculation for the setup sheet can be done manually using the equations on the example worksheets in Figures 7, 8, and 9 of this method, or by a Hewlett-Packard HP41 calculator using the program provided in appendix D of the EGR operators manual, entitled *Applications Guide for Source PM₁₀ Exhaust Gas Recycle Sampling System*. This calculation uses an approximation of the total flow rate and agrees within 1 percent of the exact solution for pressure drops at stack temperatures from 38 to 260 °C (100 to 500 °F) and stack moisture up to 50 percent. Also, the example worksheets use a constant stack temperature in the calculation, ignoring the complicated temperature dependence from all three pressure drop equations. Errors for this at stack temperatures ±28 °C (±50 °F) of the temperature used in the setup calculations are within 5 percent for flow rate and within 5 percent for cyclone cut size.

4.1.2.5 The pressure upstream of the LFE's is assumed to be constant at 0.6 in. Hg in the EGR setup calculations.

4.1.2.6 The setup sheet constructed using this procedure shall be similar to Figure 6 of this method. Inputs needed for the calculation are the same as for the setup computer except that stack velocities are not needed.

4.1.3 Preparation of Collection Train. Same as in Method 5, Section 4.1.3, except use the following directions to set up the train.

4.1.3.1 Assemble the EGR sampling device, and attach it to probe as shown in Figure 3 of this method. If stack temperatures exceed 260 °C (500 °F), then assemble the EGR cyclone without the O-ring and reduce the vacuum requirement to 130 mm Hg (5.0 in. Hg) in the leak-check procedure in Section 4.1.4.3.2 of this method.

4.1.3.2 Connect the probe directly to the filter holder and condenser as in Method 5. Connect the condenser and probe to the meter and flow control console with the umbilical connector. Plug in the pump and attach pump lines to the meter and flow control console.

4.1.4 Leak-Check Procedure. The leak-check for the EGR Method consists of two parts: the sample-side and the recycle-side. The sample-side leak-check is required at the beginning of the run with the cyclone attached, and after the run with the cyclone removed. The cyclone is removed before the post-test leak-check to prevent any disturbance of the collected sample prior to analysis. The recycle-side leak-check tests the leak tight integrity of the recycle components and is required prior to the first test run and after each shipment.

4.1.4.1 Pretest Leak-Check. A pretest leak-check of the entire sample-side, including the cyclone and nozzle, is required. Use the leak-check procedure in Section 4.1.4.3 of this method to conduct a pretest leak-check.

4.1.4.2 Leak-Checks During Sample Run. Same as in Method 5, Section 4.1.4.1.

4.1.4.3 Post-Test Leak-Check. A leak-check is required at the conclusion of each sampling run. Remove the cyclone before the leak-check to prevent the vacuum created by the cooling of the probe from disturbing the collected sample and use the following procedure to conduct a post-test leak-check.

4.1.4.3.1 The sample-side leak-check is performed as follows: After removing the cyclone, seal the probe with a leak-tight stopper. Before starting pump, close the coarse total valve and both recycle valves, and open completely the sample back pressure valve and the fine total valve. After turning the pump on, partially open the coarse total valve slowly to prevent a surge in the manometer. Adjust the vacuum to at least 381 mm Hg (15.0 in. Hg) with the fine total valve. If the desired vacuum is exceeded, either leak-check at this higher vacuum or end the leak-check as shown below and start over.

CAUTION: Do not decrease the vacuum with any of the valves. This may cause a rupture of the filter.

NOTE: A lower vacuum may be used, provided that it is not exceeded during the test.

4.1.4.3.2 Leak rates in excess of 0.00057 m³/min (0.020 ft³/min) are unacceptable. If the leak rate is too high, void the sampling run.

4.1.4.3.3 To complete the leak-check, slowly remove the stopper from the nozzle until the vacuum is near zero, then immediately turn off the pump. This procedure sequence prevents a pressure surge in the manometer fluid and rupture of the filter.

4.1.4.3.4 The recycle-side leak-check is performed as follows: Close the coarse and fine total valves and sample back pressure valve. Plug the sample inlet at the meter box. Turn on the power and the pump, close the recycle valves, and open the total flow valves. Adjust the total flow fine adjust valve until a vacuum of 25 inches of mercury is achieved. If the desired vacuum is exceeded, either leak-check at this higher vacuum, or end the leak-check and start over. Minimum acceptable leak rates are the same as for the sample-side. If the leak rate is too high, void the sampling run.

4.1.5 EGR Train Operation. Same as in Method 5, Section 4.1.5, except omit references to nomographs and recommendations about changing the filter assembly during a run.

4.1.5.1 Record the data required on a data sheet such as the one shown in Figure 10 of this method. Make periodic checks of the manometer level and zero to ensure correct ΔH and Ap values. An acceptable procedure for checking the zero is to equalize the pressure at both ends of the manometer by pulling off the tubing, allowing the fluid to equilibrate and, if necessary, to re-zero. Maintain the probe temperature to within 11 °C (20 °F) of stack temperature.

4.1.5.2 The procedure for using the example EGR setup sheet is as follows: Obtain a stack velocity reading from the pitot manometer (Ap), and find this value on the ordinate axis of the setup sheet. Find the stack temperature on the abscissa. Where these two values intersect are the differential pressures necessary to achieve isokineticity and 10 μm cut size (interpolation may be necessary).

4.1.5.3 The top three numbers are differential pressures (in. H₂O), and the bottom number is the percent recycle at these flow settings. Adjust the total flow rate valves, coarse and fine, to the sample value (ΔH) on the setup sheet, and the recycle flow rate valves, coarse and fine, to the recycle flow on the setup sheet.

4.1.5.4 For startup of the EGR sample train, the following procedure is recommended. Preheat the cyclone in the stack for 30 minutes. Close both the sample and recycle coarse valves. Open the fine total, fine recycle, and sample back pressure valves halfway. Ensure that the nozzle is properly aligned with the sample stream. After noting the Ap and stack temperature, select the appropriate ΔH and recycle from the EGR setup

sheet. Start the pump and timing device simultaneously. Immediately open both the coarse total and the coarse recycle valves slowly to obtain the approximate desired values. Adjust both the fine total and the fine recycle valves to achieve more precisely the desired values. In the EGR flow system, adjustment of either valve will result in a change in both total and recycle flow rates, and a slight iteration between the total and recycle valves may be necessary. Because the sample back pressure valve controls the total flow rate through the system, it may be necessary to adjust this valve in order to obtain the correct flow rate.

NOTE: Isokinetic sampling and proper operation of the cyclone are not achieved unless the correct ΔH and recycle flow rates are maintained.

4.1.5.5 During the test run, monitor the probe and filter temperatures periodically, and make adjustments as necessary to maintain the desired temperatures. If the sample loading is high, the filter may begin to blind or the cyclone may clog. The filter or the cyclone may be replaced during the sample run. Before changing the filter or cyclone, conduct a leak-check (Section 4.1.4.2 of this method). The total particulate mass shall be the sum of all cyclone and the filter catch during the run. Monitor stack temperature and Ap periodically, and make the necessary adjustments in sampling and recycle flow rates to maintain isokinetic sampling and the proper flow rate through the cyclone. At the end of the run, turn off the pump, close the coarse total valve, and record the final dry gas meter reading. Remove the probe from the stack, and conduct a post-test leak-check as outlined in Section 4.1.4.3 of this method.

4.2 Sample Recovery. Allow the probe to cool. When the probe can be safely handled, wipe off all external PM adhering to the outside of the nozzle, cyclone, and nozzle attachment, and place a cap over the nozzle to prevent losing or gaining PM. Do not cap the nozzle tip tightly while the sampling train is cooling, as this action would create a vacuum in the filter holder. Disconnect the probe from the umbilical connector, and take the probe to the cleanup site. Sample recovery should be conducted in a dry indoor area or, if outside, in an area protected from wind and free of dust. Cap the ends of the impingers and carry them to the cleanup site. Inspect the components of the train prior to and during disassembly to note any abnormal conditions. Disconnect the pitot from the cyclone. Remove the cyclone from the probe. Recover the sample as follows:

4.2.1 *Container Number 1 (Filter)*. The recovery shall be the same as that for Container Number 1 in Method 5, Section 4.2.

4.2.2 *Container Number 2 (Cyclone or Large PM Catch)*. The cyclone must be disassembled.

bled and the nozzle removed in order to recover the large PM catch. Quantitatively recover the PM from the interior surfaces of the nozzle and the cyclone, excluding the "turn around" cup and the interior surfaces of the exit tube. The recovery shall be the same as that for Container Number 2 in Method 5, Section 4.2.

4.2.3 *Container Number 3 (PM₁₀)*. Quantitatively recover the PM from all of the surfaces from cyclone exit to the front half of the in-stack filter holder, including the "turn around" cup and the interior of the exit tube. The recovery shall be the same as that for Container Number 2 in Method 5, Section 4.2.

4.2.4 *Container Number 4 (Silica Gel)*. Same as that for Container Number 3 in Method 5, Section 4.2.

4.2.5 *Impinger Water*. Same as in Method 5, Section 4.2, under "Impinger Water."

4.3 *Analysis*. Same as in Method 5, Section 4.3, except handle EGR Container Numbers 1 and 2 like Container Number 1 in Method 5, EGR Container Numbers 3, 4, and 5 like Container Number 3 in Method 5, and EGR Container Number 6 like Container Number 3 in Method 5. Use Figure 11 of this method to record the weights of PM collected.

4.4 *Quality Control Procedures*. Same as in Method 5, Section 4.4.

4.5 *PM₁₀ Emission Calculation and Acceptability of Results*. Use the EGR reduction program or the procedures in section 6 of this method to calculate PM₁₀ emissions and the criteria in section 6.7 of this method to determine the acceptability of the results.

5. Calibration

Maintain an accurate laboratory log of all calibrations.

5.1 *Probe Nozzle*. Same as in Method 5, Section 5.1.

5.2 *Pitot Tube*. Same as in Method 5, Section 5.2.

5.3 *Meter and Flow Control Console*.

5.3.1 *Dry Gas Meter*. Same as in Method 5, Section 5.3.

5.3.2 *LFE Gauges*. Calibrate the recycle, total, and inlet total LFE gauges with a manometer. Read and record flow rates at 10, 50, and 90 percent of full scale on the total and recycle pressure gauges. Read and record flow rates at 10, 20, and 30 percent of full scale on the inlet total LFE pressure gauge. Record the total and recycle readings to the nearest 0.3 mm (0.01 in.). Record the inlet total LFE readings to the nearest 3 mm (0.1 in.). Make three separate measurements at each setting and calculate the average. The maximum difference between the average pressure reading and the average manometer reading shall not exceed 1 mm (0.05 in.). If the differences exceed the limit specified, adjust or replace the pressure gauge. After

each field use, check the calibration of the pressure gauges.

5.3.3 *Total LFE*. Same as the metering system in Method 5, Section 5.3.

5.3.4 *Recycle LFE*. Same as the metering system in Method 5, Section 5.3, except completely close both the coarse and fine recycle valves.

5.4 *Probe Heater*. Connect the probe to the meter and flow control console with the umbilical connector. Insert a thermocouple into the probe sample line approximately half the length of the probe sample line. Calibrate the probe heater at 66°C (150°F), 121°C (250°F), and 177°C (350°F). Turn on the power, and set the probe heater to the specified temperature. Allow the heater to equilibrate, and record the thermocouple temperature and the meter and flow control console temperature to the nearest 0.5°C (1°F). The two temperatures should agree within 5.5°C (10°F). If this agreement is not met, adjust or replace the probe heater controller.

5.5 *Temperature Gauges*. Connect all thermocouples, and let the meter and flow control console equilibrate to ambient temperature. All thermocouples shall agree to within 1.1°C (2.0°F) with a standard mercury-in-glass thermometer. Replace defective thermocouples.

5.6 *Barometer*. Calibrate against a standard mercury-in-glass barometer.

5.7 *Probe Cyclone and Nozzle Combinations*. The probe cyclone and nozzle combinations need not be calibrated if the cyclone meets the design specifications in Figure 12 of this method and the nozzle meets the design specifications in appendix B of the *Application Guide for the Source PM₁₀ Exhaust Gas Recycle Sampling System*, EPA/600/3-88-068. This document may be obtained from Roy Huntley at (919) 541-1060. If the nozzles do not meet the design specifications, then test the cyclone and nozzle combination for conformity with the performance specifications (PS's) in Table 1 of this method. The purpose of the PS tests is to determine if the cyclone's sharpness of cut meets minimum performance criteria. If the cyclone does not meet design specifications, then, in addition to the cyclone and nozzle combination conforming to the PS's, calibrate the cyclone and determine the relationship between flow rate, gas viscosity, and gas density. Use the procedures in Section 5.7.5 of this method to conduct PS tests and the procedures in Section 5.8 of this method to calibrate the cyclone. Conduct the PS tests in a wind tunnel described in Section 5.7.1 of this method and using a particle generation system described in Section 5.7.2 of this method. Use five particle sizes and three wind velocities as listed in Table 2 of this method. Perform a minimum of three replicate measurements of collection efficiency for each of the 15 conditions listed, for a minimum of 45 measurements.

5.7.1 *Wind Tunnel*. Perform calibration and PS tests in a wind tunnel (or equivalent test apparatus) capable of establishing and maintaining the required gas stream velocities within 10 percent.

5.7.2 *Particle Generation System*. The particle generation system shall be capable of producing solid monodispersed dye particles with the mass median aerodynamic diameters specified in Table 2 of this method. The particle size distribution verification should be performed on an integrated sample obtained during the sampling period of each test. An acceptable alternative is to verify the size distribution of samples obtained before and after each test, with both samples required to meet the diameter and monodispersity requirements for an acceptable test run.

5.7.2.1 Establish the size of the solid dye particles delivered to the test section of the wind tunnel using the operating parameters of the particle generation system, and verify the size during the tests by microscopic examination of samples of the particles collected on a membrane filter. The particle size, as established by the operating parameters of the generation system, shall be within the tolerance specified in Table 2 of this method. The precision of the particle size verification technique shall be at least ±0.5 µm, and the particle size determined by the verification technique shall not differ by more than 10 percent from that established by the operating parameters of the particle generation system.

5.7.2.2 Certify the monodispersity of the particles for each test either by microscopic inspection of collected particles on filters or by other suitable monitoring techniques such as an optical particle counter followed by a multichannel pulse height analyzer. If the proportion of multiplate and satellites in an aerosol exceeds 10 percent by mass, the particle generation system is unacceptable for purposes of this test. Multiplate particles are particles that are agglomerated, and satellites are particles that are smaller than the specified size range.

$$\sigma = \left[\frac{(E_1^2 + E_2^2 + E_3^2) - \frac{(E_1 + E_2 + E_3)^2}{3}}{2} \right]^{1/2}$$

If σ exceeds 0.10, repeat the replicate runs.

5.7.5.4 Using the cyclone flow rate that produces D₅₀ for 10 µm, measure the overall efficiency of the cyclone and nozzle, E_c, at the particle sizes and nominal gas velocities in Table 2 of this method using this following procedure.

5.7.5.5 Set the air velocity in the wind tunnel to one of the nominal gas velocities

5.7.3 *Schematic Drawings*. Schematic drawings of the wind tunnel and blower system and other information showing complete procedural details of the test atmosphere generation, verification, and delivery techniques shall be furnished with calibration data to the reviewing agency.

5.7.4 *Flow Rate Measurement*. Determine the cyclone flow rates with a dry gas meter and a stopwatch, or a calibrated orifice system capable of measuring flow rates to within 2 percent.

5.7.5 *Performance Specification Procedure*. Establish the test particle generator operation and verify the particle size microscopically. If monodispersity is to be verified by measurements at the beginning and the end of the run rather than by an integrated sample, these measurements may be made at this time.

5.7.5.1 The cyclone cut size (D₅₀) is defined as the aerodynamic diameter of a particle having a 50 percent probability of penetration. Determine the required cyclone flow rate at which D₅₀ is 10 µm. A suggested procedure is to vary the cyclone flow rate while keeping a constant particle size of 10 µm. Measure the PM collected in the cyclone (m_c), exit tube (m_e), and filter (m_f). Compute the cyclone efficiency (E_c) as follows:

$$E_c = \frac{m_c}{(m_c + m_e + m_f)} \times 100$$

5.7.5.2 Perform three replicates and calculate the average cyclone efficiency as follows:

$$E_{avg} = \frac{(E_1 + E_2 + E_3)}{3}$$

where E₁, E₂, and E₃ are replicate measurements of E_c.

5.7.5.3 Calculate the standard deviation (σ) for the replicate measurements of E_c as follows:

from Table 2 of this method. Establish isokinetic sampling conditions and the correct flow rate through the sampler (cyclone and nozzle) using recycle capacity so that the D₅₀ is 10 µm. Sample long enough to obtain ±5 percent precision on the total collected mass as determined by the precision and the sensitivity of the measuring technique. Determine separately the nozzle catch

(m_a), cyclone catch (m_c), cyclone exit tube catch (m_e), and collection filter catch (m_f).

5.7.5.6 Calculate the overall efficiency (E_o) as follows:

$$E_o = \frac{(m_a + m_c)}{(m_a + m_c + m_e + m_f)} \times 100$$

5.7.5.7 Do three replicates for each combination of gas velocities and particle sizes in Table 2 of this method. Calculate E_o for each particle size following the procedures described in this section for determining efficiency. Calculate the standard deviation (σ) for the replicate measurements. If σ exceeds 0.10, repeat the replicate runs.

5.7.6 Criteria for Acceptance. For each of the three gas stream velocities, plot the average E_o as a function of particle size on Figure 13 of this method. Draw a smooth curve for each velocity through all particle sizes. The curve shall be within the banded region for all sizes, and the average E_o for a D_{50} for 10 μ m shall be 50 ± 0.5 percent.

5.8 Cyclone Calibration Procedure. The purpose of this section is to develop the relationship between flow rate, gas viscosity, gas density, and D_{50} . This procedure only needs to be done on those cyclones that do not meet the design specifications in Figure 12 of this method.

5.8.1 Calculate cyclone flow rate. Determine the flow rates and D_{50} 's for three different particle sizes between 5 μ m and 15 μ m, one of which shall be 10 μ m. All sizes must be

$$Q = \frac{\pi \mu_{cyc}}{4} \left[\frac{(3000)(K_1)^2}{m} \right] \left[\frac{T_1}{M_c P_1} \right]^{m/(m-0.5)} d^{(m-1.5)/(m-0.5)}$$

where:

Q = Cyclone flow rate for a cut size of 10 μ m, cm^3/sec .

T_1 = Stack gas temperature, $^{\circ}\text{K}$.

d = Diameter of nozzle, cm.

$K_1 = 4.077 \times 10^{-3}$.

5.8.2 Directions for Using Q . Refer to Section 5 of the EGR operators manual for directions in using this expression for Q in the setup calculations.

6. Calculations

6.1 The EGR data reduction calculations are performed by the EGR reduction computer program, which is written in IBM BASIC computer language and is available through NTIS, Accession number PB90-500000, 5285 Port Royal Road, Springfield, Virginia 22161. Examples of program inputs and outputs are shown in Figure 14 of this method.

within 0.5 μ m. For each size, use a different temperature within 60°C (108°F) of the temperature at which the cyclone is to be used and conduct triplicate runs. A suggested procedure is to keep the particle size constant and vary the flow rate. Some of the values obtained in the PS tests in Section 5.7.5 may be used.

5.8.1.1 On log-log graph paper, plot the Reynolds number (Re) on the abscissa, and the square root of the Stokes 50 number $[(STK_{50})^{1/2}]$ on the ordinate for each temperature. Use the following equations:

$$Re = \frac{4\rho Q_{cyc}}{d_{cyc}\mu_{cyc}}$$

$$(STK_{50})^{1/2} = \left[\frac{4 Q_{cyc} (D_{50})^2}{9 \pi \mu_{cyc} (d_{cyc})^3} \right]^{1/2}$$

where:

Q_{cyc} = Cyclone flow rate cm^3/sec .

ρ = Gas density, g/cm^3 .

d_{cyc} = Diameter of cyclone inlet, cm.

μ_{cyc} = Viscosity of gas through the cyclone, poise.

D_{50} = Cyclone cut size, cm.

5.8.1.2 Use a linear regression analysis to determine the slope (m), and the y-intercept (b). Use the following formula to determine Q , the cyclone flow rate required for a cut size of 10 μ m.

6.1.1 Calculations can also be done manually, as specified in Method 5, Sections 6.3 through 6.7, and 6.9 through 6.12, with the addition of the following:

6.1.2 Nomenclature.

B_c = Moisture fraction of mixed cyclone gas, by volume, dimensionless.

C_1 = Viscosity constant, 51.12 micropoise for $^{\circ}\text{K}$ (51.05 micropoise for $^{\circ}\text{R}$).

C_2 = Viscosity constant, 0.372 micropoise/ $^{\circ}\text{K}$ (0.207 micropoise/ $^{\circ}\text{R}$).

C_3 = Viscosity constant, 1.05×10^{-4} micropoise/ $^{\circ}\text{K}^2$ (3.24×10^{-5} micropoise/ $^{\circ}\text{R}^2$).

C_4 = Viscosity constant, 53.147 micropoise/fraction O_2 .

C_5 = Viscosity constant, 74.143 micropoise/fraction H_2O .

D_{50} = Diameter of particles having a 50 percent probability of penetration, μ m.

f_{O_2} = Stack gas fraction O_2 , by volume, dry basis.

Environmental Protection Agency

$K_1 = 0.3858 \text{ } ^{\circ}\text{K}/\text{mm Hg}$ ($17.64 \text{ } ^{\circ}\text{R}/\text{in. Hg}$).

M_c = Wet molecular weight of mixed gas through the PM_{10} cyclone, $\text{g}/\text{g-mole}$ ($\text{lb}/\text{lb-mole}$).

M_d = Dry molecular weight of stack gas, $\text{g}/\text{g-mole}$ ($\text{lb}/\text{lb-mole}$).

P_{bar} = Barometer pressure at sampling site, mm Hg (in. Hg).

P_{in} = Gauge pressure at inlet to total LFE, mm Hg ($\text{in. H}_2\text{O}$).

P_1 = Absolute stack pressure, mm Hg (in. Hg).

Q_c = Total cyclone flow rate at wet cyclone conditions, m^3/min (ft^3/min).

$Q_{\text{(std)}}$ = Total cyclone flow rate at standard conditions, dscm/min (dscf/min).

T_m = Average temperature of dry gas meter, $^{\circ}\text{K}$ ($^{\circ}\text{R}$).

T_1 = Average stack gas temperature, $^{\circ}\text{K}$ ($^{\circ}\text{R}$).

$V_{w(\text{std})}$ = Volume of water vapor in gas sample (standard conditions), scm (scf).

X_T = Total LFE linear calibration constant, $\text{m}^3/[(\text{min})(\text{mm H}_2\text{O})]$ ($\text{ft}^3/[(\text{min})(\text{in. H}_2\text{O})]$).

Y_T = Total LFE linear calibration constant, dscm/min (dscf/min).

$$Q_{\text{(std)}} = K_1 \left[X_T \Delta P \frac{\mu_{\text{std}}}{\mu_{\text{FE}}} + Y_T \right] \frac{P_{\text{bar}} + P_{\text{in}}/13.6}{T_m}$$

The flow rate, at actual cyclone conditions, is calculated as follows:

$$Q_c = \frac{T_1}{K_1 P_1} \left[Q_{\text{(std)}} + \frac{V_{w(\text{std})}}{\theta} \right]$$

The flow rate, at actual cyclone conditions, is calculated as follows:

$$Q_c = \frac{T_1}{K_1 P_1} \left[Q_{\text{(std)}} + \frac{V_{w(\text{std})}}{\theta} \right]$$

6.6 Aerodynamic Cut Size. Use the following procedure to determine the aerodynamic cut size (D_{50}).

6.6.1 Determine the water fraction of the mixed gas through the cyclone by using the equation below.

ΔP_T = Pressure differential across total LFE, mm H_2O ($\text{in. H}_2\text{O}$).

θ = Total sampling time, min.

μ_{cyc} = Viscosity of mixed cyclone gas, micropoise.

μ_{FE} = Viscosity of gas laminar flow elements, micropoise.

μ_{std} = Viscosity of standard air, 180.1 micropoise.

6.2 PM_{10} Particulate Weight. Determine the weight of PM_{10} by summing the weights obtained from Container Numbers 1 and 3, less the acetone blank.

6.3 Total Particulate Weight. Determine the particulate catch for PM greater than PM_{10} from the weight obtained from Container Number 2 less the acetone blank, and add it to the PM_{10} particulate weight.

6.4 PM_{10} Fraction. Determine the PM_{10} fraction of the total particulate weight by dividing the PM_{10} particulate weight by the total particulate weight.

6.5 Total Cyclone Flow Rate. The average flow rate at standard conditions is determined from the average pressure drop across the total LFE and is calculated as follows:

$$B_c = \frac{V_{w(\text{std})}}{Q_{\text{(std)}} \theta + V_{w(\text{std})}}$$

6.6.2 Calculate the cyclone gas viscosity as follows:

$\mu_{cyc} = C_1 + C_2 T_1 + C_3 T_1^2 + C_4 f_{\text{O}_2} - C_5 B_c$

6.6.3 Calculate the molecular weight on a wet basis of the cyclone gas as follows:

$M_c = M_d(1 - B_c) + 18.0(B_c)$

6.6.4 If the cyclone meets the design specification in Figure 12 of this method, calculate the actual D_{50} of the cyclone for the run as follows:

$$D_{50} = \beta_1 \left[\frac{T_1}{M_c P_1} \right]^{0.2091} \left[\frac{\mu_{cyc}}{Q_c} \right]^{0.7091}$$

where $\beta_1 = 0.1562$.

6.6.5 If the cyclone does not meet the design specifications in Figure 12 of this method, then use the following equation to calculate D_{50} .

$$D_{50} = (3)(10)^6 (7.376 \times 10^{-4})^m$$

$$\left[\frac{M_c P_i}{T_i} \right] \left[\frac{4 Q_c}{\pi \mu_{cyc}} \right] d(1.5-m)$$

where:

m = Slope of the calibration curve obtained in Section 5.8.2.

b = y-intercept of the calibration curve obtained in Section 5.8.2.

6.7 Acceptable Results. Acceptability of anisokinetic variation is the same as Method 5, Section 6.12.

6.7.1 If $9.0 \mu m \leq D_{50} \leq 11 \mu m$ and $90 \leq I \leq 110$, the results are acceptable. If D_{50} is greater than $11 \mu m$, the Administrator may accept the results. If D_{50} is less than $9.0 \mu m$, reject the results and repeat the test.

7. Bibliography

1. Same as Bibliography in Method 5.

2. McCain, J.D., J.W. Ragland, and A.D. Williamson. Recommended Methodology for the Determination of Particles Size Distributions in Ducted Sources, Final Report. Prepared for the California Air Resources Board by Southern Research Institute. May 1986.

3. Farthing, W.E., S.S. Dawes, A.D. Williamson, J.D. McCain, R.S. Martin, and J.W. Ragland. Development of Sampling Methods for Source PM-10 Emissions. Southern Research Institute for the Environmental Protection Agency. April 1989.

4. Application Guide for the Source PM₁₀ Exhaust Gas Recycle Sampling System, EPA/600/3-88-058.

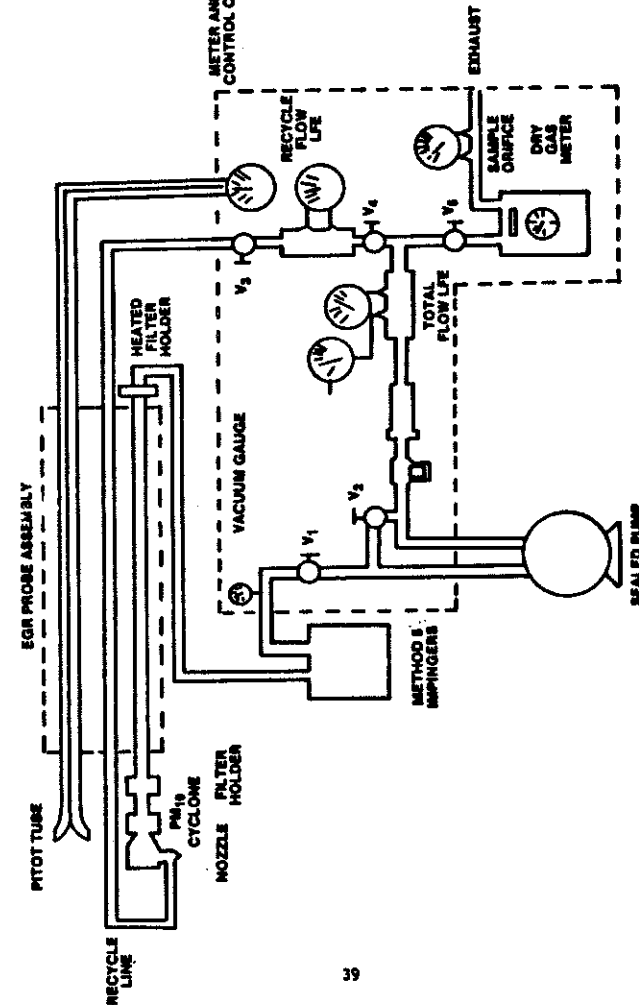


Figure 1. Schematic of the exhaust gas recycle train.

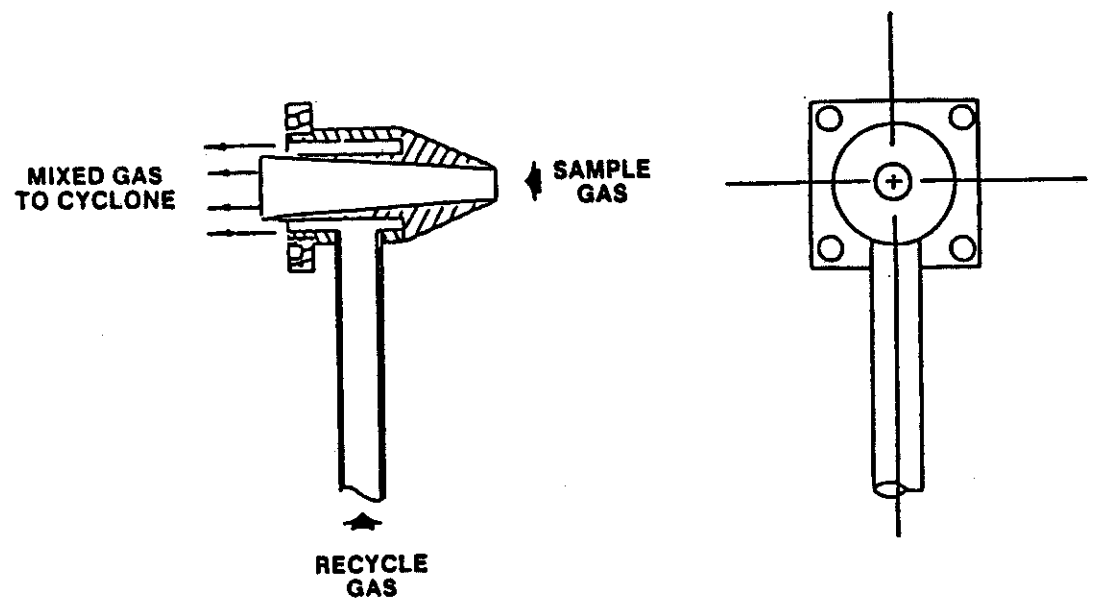


Figure 2. Schematic of EGR nozzle assembly.

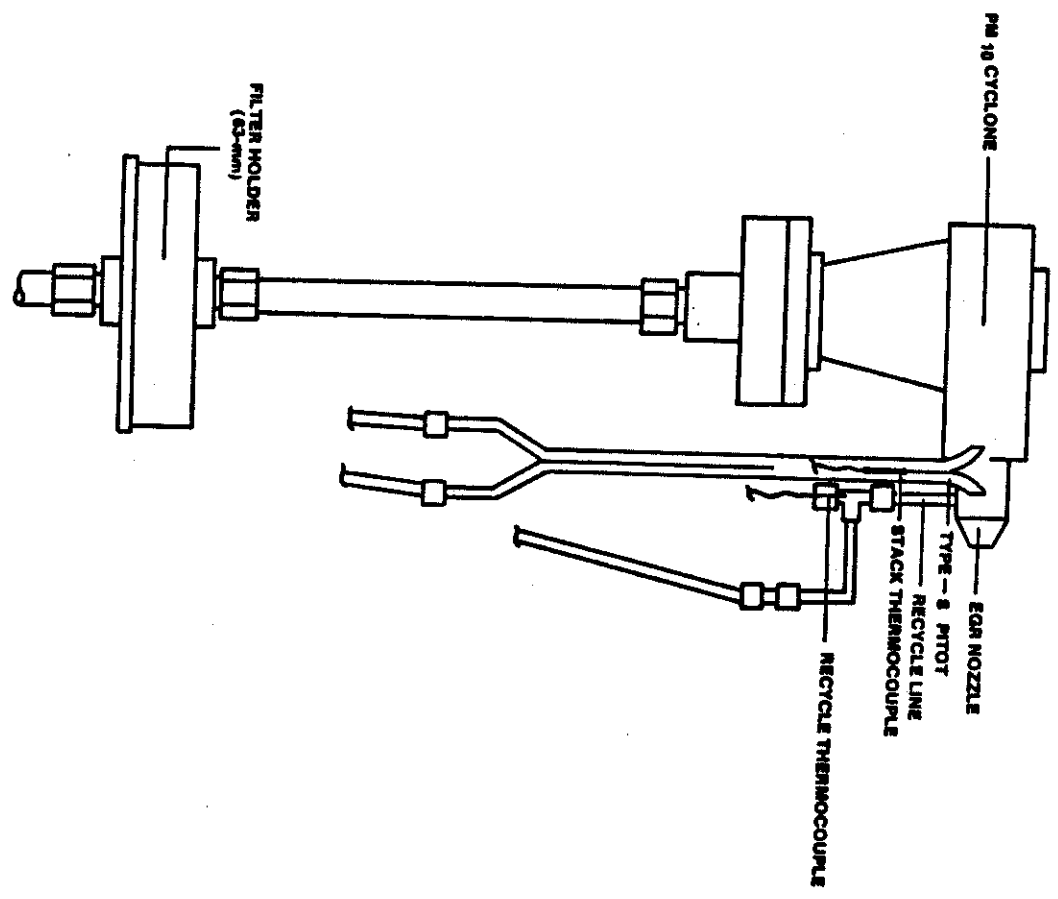


Figure 3. EGR PM10 cyclone sampling device.

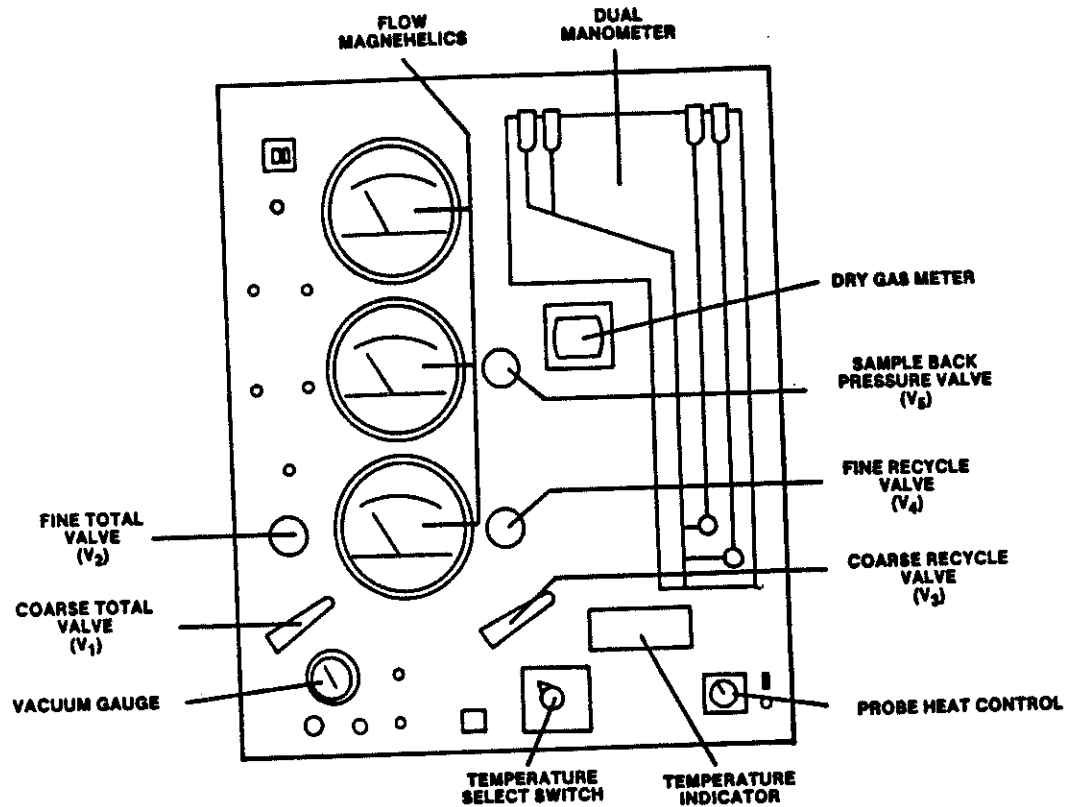


Figure 4. Example EGR control module (front view) showing principle components.

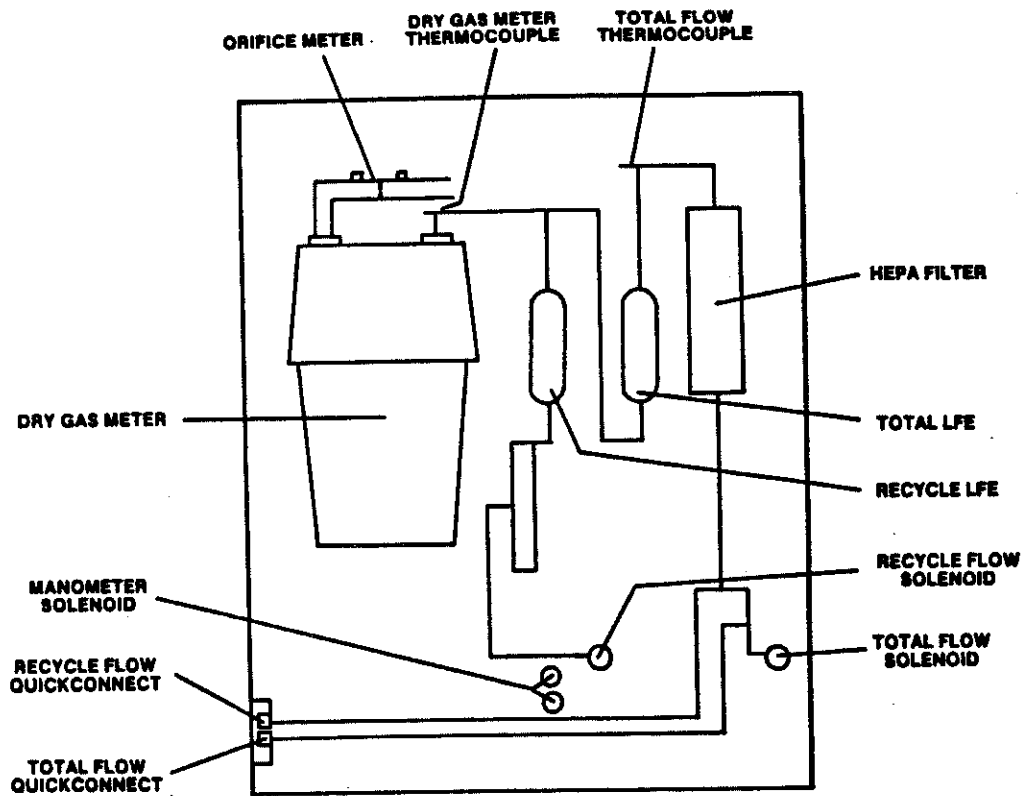


Figure 5. Example EGR control module (rear view) showing principle components.

EXAMPLE EMISSION GAS RECYCLE
SETUP SHEET

VERSION 3.1 MAY 1986

TEST I.D.: SAMPLE SETUP

RUN DATE: 11/24/86

LOCATION: SOURCE SIM

OPERATOR(S): RH JB

NOZZLE DIAMETER (IN): .25

STACK CONDITIONS:

AVERAGE TEMPERATURE (F): 200.0

AVERAGE VELOCITY (FT/SEC): 15.0

AMBIENT PRESSURE (IN HG): 29.92

STACK PRESSURE (IN H2O): .10

GAS COMPOSITION.

H2O=10.0% MD=28.84

O2=20.9% MW=27.75

CO2=.0% (LB/LB
MOLE)

TARGET PRESSURE DROPS

TEMPERATURE (F)

DP(PTO) .	150	161	172	183	194	206	217	228
0.026	SAMPLE .49	.49	.48	.47	.46	.45	.45	.45
	TOTAL 1.90	1.90	1.91	1.92	1.92	1.92	1.93	1.93
	RECYCLE 2.89	2.92	2.94	2.97	3.00	3.02	3.06	3.06
	% RCL 61%	61%	62%	62%	63%	63%	63%	63%
.031 .....	.58	.56	.55	.55	.55	.54	.53	.52
	1.88	1.89	1.89	1.90	1.91	1.91	1.91	1.92
	2.71	2.74	2.77	2.80	2.82	2.85	2.88	2.90
	57%	57%	58%	58%	59%	59%	60%	60%
.035 .....	.67	.65	.64	.63	.62	.61	.60	.59
	1.88	1.88	1.89	1.89	1.90	1.90	1.91	1.91
	2.57	2.60	2.63	2.66	2.69	2.72	2.74	2.74
	54%	55%	55%	56%	56%	57%	57%	57%
.039 .....	.75	.74	.72	.71	.70	.69	.67	.66
	1.87	1.88	1.88	1.89	1.89	1.90	1.90	1.91
	2.44	2.47	2.50	2.53	2.56	2.59	2.62	2.65
	51%	52%	52%	53%	53%	54%	54%	55%

Figure 6. Example EGR setup sheet.

Barometric pressure, P_{bar} , in. Hg.	=	Pitot coefficient, C_p	=
Stack static pressure, P_s , in. Hg.	=	ΔH_{\oplus} , in. H ₂ O	=
Average stack temperature, T_s , °F.	=	Molecular weight of stack gas, dry basis:	
Meter temperature, T_m , °F.	=	$M_d=0.44$	
Gas analysis:		(%CO ₂)+0.32	= lb/lb mole
%CO ₂	=	(%O ₂)+0.28	
%O ₂	=	(%N ₂ +%CO)	
%N ₂ +%CO	=	Molecular weight of stack gas, wet basis:	
Fraction moisture content, B_{ws} .	=	$M_{ws}=M_d(1-B_{ws})+18B_{ws}$	= lb/lb mole
Calibration data:		Absolute stack pressure:	
Nozzle diameter, D_n , in.	=	$P_s=P_{bar}+(P_g/13.6)$	= in. Hg

$$K=846.72 D_n^4 \Delta H_{\oplus} C_p^2 (1-B_{ws})^2 \frac{M_d (t_m+460) P_s}{M_{ws} (t_s+460) P_{bar}} = \text{---}$$

Desired meter orifice pressure (ΔH) for velocity head of stack gas (Δp): $\Delta H=K \Delta p= \text{---}$ in. H₂O

Figure 7. Example worksheet 1, meter orifice pressure head calculation.

Barometric pressure, P_{bar} , in. Hg.	=	Pitot coefficient, C_p	=
Absolute stack pressure, P_s , in. Hg.	=	Total LFE calibration constant, X_s .	=
Average stack temperature, T_s , °R.	=	Total LFE calibration constant, T_s .	=
Meter temperature, T_m , °R.	=	Absolute pressure upstream of LFE:	
Molecular weight of stack gas, wet basis, M_d lb/lb mole.	=	$P_{LFE}=P_{bar}+0.6$	= in. Hg
Pressure upstream of LFE, in. Hg.	= 0.6	Viscosity of gas in total LFE:	
Gas analysis:		$\mu_{LFE}=152.418+0.2552$	
%O ₂	=	$T_m+3.2355 \times 10^{-5}$	
Fraction moisture content, B_{ws} .	=	$T_m+0.53147 (\%O_2)$	
Calibration data:		Viscosity of dry stack gas:	
Nozzle diameter, D_n , in.	=	$\mu_d=152.418+0.2552$	
		$T_s+3.2355 \times 10^{-5}$	
		$T_s+0.53147 (\%O_2)$	

Constants:

$$K_1=1.5752 \times 10^{-5} \frac{\mu_{LFE} T_m P_s^{0.7051} \mu_d}{P_{LFE} M_d^{0.2949} T_s^{0.7051}} = \text{---}$$

$$K_2=0.1539 \frac{\mu_{LFE} T_m D_n^2 C_p}{P_{LFE}} \left[\frac{P_s}{T_s} \right]^{1/2}$$

$$K_3 = \frac{B_{ws} \mu_d [1-0.2949 (1-18/M_d)] + 74.143 B_{ws} (1-B_{ws})}{\mu_d - 74.143 B_{ws}} = \text{---}$$

$$A_1 = \frac{K_1}{X_s} - \frac{\mu_{LFE} Y_1}{180.1 X_s} = \text{---}$$

$$B_1 = \frac{K_2 K_3}{(M_{ws})^{1/2} X_s} = \text{---}$$

Total LFE pressure head:
 $\Delta p=A_1-B_1 (\Delta p)^{1/2} = \text{---}$ in. H₂O

Figure 8. Example worksheet 2, total LFE pressure head.

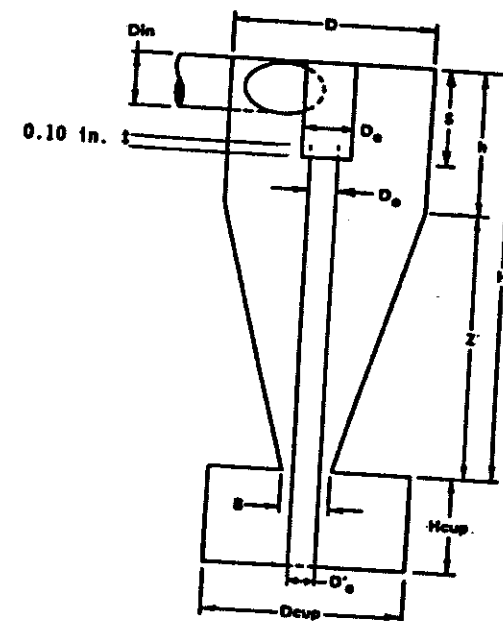
Barometric pressure, P_{bar} , in. Hg.	=	Molecular weight of stack gas, dry basis, M_d , lb/lb mole.	=
Absolute stack pressure, P_s , in. Hg.	=	Viscosity of LFE gas, μ_{LFE} , poise.	=
Average stack temperature, T_s , °R.	=	Viscosity of dry stack gas, μ_d , poise.	=
Meter temperature, T_m , °R.	=		

Plant _____
 Date _____
 Run no. _____
 Filter no. _____
 Amount liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml (2) _____ (3) _____
 Acetone blank conc., mg/mg (Equation 5-4, Method 5) _____
 Acetone wash blank, mg (Equation 5-5, Method 5) _____

Container number	Weight of particulate matter, mg		
	Final weight	Tare weight	Weight gain
1
3
Total
Less acetone blank
Weight of PM ₁₀
2
Less acetone blank
Total particulate weight

Figure 11. EGR method analysis sheet.

Cyclone Interior Dimensions



Dimensions (±0.02 cm, ±0.01 in.)												
cm	D1n	D	De	S	H	h	Z	S	Hcup	Dcup	D'	D _o
inches	1.27	4.47	1.50	1.88	6.95	2.24	4.71	1.57	2.25	4.45	1.02	1.24
	0.50	1.78	0.59	0.74	2.74	0.88	1.85	0.62	0.89	1.75	0.40	0.49

Figure 12. Cyclone design specifications.

TABLE 1. PERFORMANCE SPECIFICATIONS FOR SOURCE PM₁₀ Cyclones and Nozzle Combinations

Parameter	Units	Specification
1. Collection efficiency.	Percent	Such that collection efficiency falls within envelope specified by Section 5.7.6 and Figure 13.
2. Cyclone cut size (D ₅₀).	μm	10±1 μm aerodynamic diameter.

TABLE 2. PARTICLE SIZES AND NOMINAL GAS VELOCITIES FOR EFFICIENCY

Particle size (μm) ^a	Target gas velocities (m/sec)		
	7±1.0	15±1.5	25±2.5
5±0.5
7±0.5
10±0.5
14±1.0
20±1.0

(a) Mass median aerodynamic diameter.

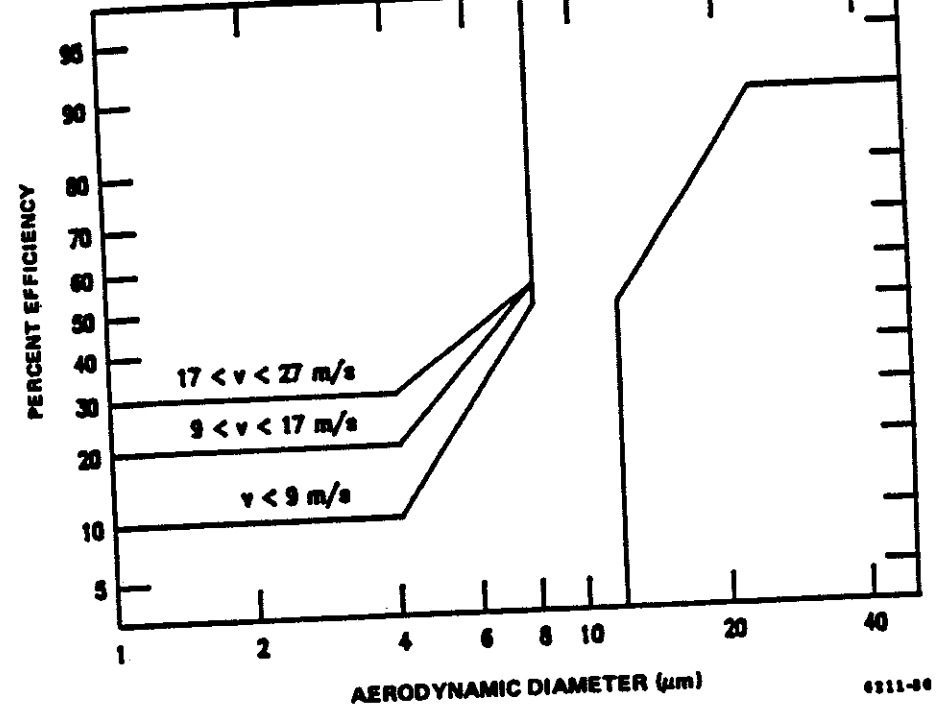


Figure 13. Efficiency envelope for the PM₁₀ cyclone.

EMISSION GAS RECYCLE, DATA REDUCTION, VERSION 3.4 MAY 1986

Test ID. Code: Chapel Hill 2.
Test Location: Baghouse Outlet.
Test Site: Chapel Hill.
Test Date: 10/20/86.
Operator(s): JB RH MH.

Entered Run Data

Temperatures:
T(STK) 251.0 F
T(RCL) 259.0 F
T(LFE) 81.0 F
T(DGM) 76.0 F
System Pressures:
DH(ORI) 1.18 INWG
DP(TOT) 1.91 INWG
P(INL) 12.16 INWG
DP(RCL) 2.21 INWG
DP(PTO) 0.06 INWG
Miscellaneous:
P(BAR) 29.99 INWG
DP(STK) 0.10 INWG
V(DGM) 13.744 FT3
TIME 60.00 MIN
% CO2 8.00
% O2 20.00
NOZ (IN) 0.2500
Water Content:
Estimate 0.0%
or
Condenser 7.0 ML

Column 0.0 GM
Raw Masses:
Cyclone 1 21.7 MG
Filter 11.7 MG
Impinger Residue 0.0 MG
Blank Values:
CYC Rinse 0.0 MG
Filter Holder Rinse 0.0 MG
Filter Blank 0.0 MG
Impinger Rinse 0.0 MG

Calibration Values:
CP(PITOT) 0.840
DH@ORI 10.900
M(TOT LFE) 0.2280
B(TOT LFE) -0.0058
M(RCL LFE) 0.0048
B(RCL LFE) -0.0007
DGM GAMMA 0.9940

Reduced Data

Stack Velocity (FT/SEC) 15.96
Stack Gas Moisture (%) 2.4
Sample Flow Rate (ACFM) 0.3104
Total Flow Rate (ACFM) 0.5819
Recycle Flow Rate (ACFM) 0.2780
Percent Recycle 48.7
Isokinetic Ratio (%) 95.1

	(Particulate)		(MG/DNCF)	(GR/ACF)	(GR/DCF)	(LB/DSCF (X 1E6))
	(UM)	(% <)				
Cyclone 1	10.15	35.8	58.6	0.01794	0.02470	3.53701
Backup Filter			30.5	0.00688	0.01332	1.907
Particulate Total			87.2	0.02782	0.03802	5.444

Note: Figure 14. Example inputs and outputs of the EGR reduction program.

METHOD 201A—DETERMINATION OF PM₁₀ EMISSIONS (CONSTANT SAMPLING RATE PROCEDURE)

1. Applicability and Principle

1.1 Applicability. This method applies to the in-stack measurement of particulate matter (PM) emissions equal to or less than an aerodynamic diameter of nominally 10 (PM₁₀) from stationary sources. The EPA recognizes that condensable emissions not collected by an in-stack method are also PM₁₀, and that emissions that contribute to ambient, PM₁₀ levels are the sum of condensable emissions and emissions measured by an in-stack PM₁₀ method, such as this method or Method 201. Therefore, for establishing source contributions to ambient levels of PM₁₀, such as for emission inventory purposes, EPA suggests that source PM₁₀ measurement include both in-stack PM₁₀ and condensable emissions. Condensable emissions

may be measured by an impinger analysis in combination with this method.

1.2 Principle. A gas sample is extracted at a constant flow rate through an in-stack sizing device, which separates PM greater than PM₁₀. Variations from isokinetic sampling conditions are maintained within well-defined limits. The particulate mass is determined gravimetrically after removal of uncombined water.

2. Apparatus

NOTE: Methods cited in this method are part of 40 CFR part 60, appendix A.

2.1 Sampling Train. A schematic of the Method 201A sampling train is shown in Figure 1 of this method. With the exception of the PM₁₀ sizing device and in-stack filter, this train is the same as an EPA Method 17 train.

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2.1.1 Nozzle. Stainless steel (316 or equivalent) with a sharp tapered leading edge. Eleven nozzles that meet the design specification in Figure 2 of this method are recommended. A larger number of nozzles with small nozzle increments increase the likelihood that a single nozzle can be used for the entire traverse. If the nozzles do not meet the design specifications in Figure 2 of this method, then the nozzles must meet the criteria in Section 5.2 of this method.

2.1.2 PM₁₀ Sizer. Stainless steel (316 or equivalent), capable of determining the PM₁₀ fraction. The sizing device shall be either a cyclone that meets the specifications in Section 5.2 of this method or a cascade impactor that has been calibrated using the procedure in Section 5.4 of this method.

2.1.3 Filter Holder. 63-mm, stainless steel. An Andersen filter, part number SE274, has been found to be acceptable for the in-stack filter. NOTE: Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

2.1.4 Pitot Tube. Same as in Method 5, Section 2.1.3. The pitot lines shall be made of heat resistant tubing and attached to the probe with stainless steel fittings.

2.1.5 Probe Liner. Optional, same as in Method 5, Section 2.1.2.

2.1.6 Differential Pressure Gauge, Condenser, Metering System, Barometer, and Gas Density Determination Equipment. Same as in Method 5, Sections 2.1.4, and 2.1.7 through 2.1.10, respectively.

2.2 Sample Recovery.

2.2.1 Nozzle, Sizing Device, Probe, and Filter Holder Brushes. Nylon bristle brushes with stainless steel wire shafts and handles, properly sized and shaped for cleaning the nozzle, sizing device, probe or probe liner, and filter holders.

2.2.2 Wash Bottles, Glass Sample Storage Containers, Petri Dishes, Graduated Cylinder and Balance, Plastic Storage Containers, Funnel and Rubber Policeman, and Funnel. Same as in Method 5, Sections 2.2.2 through 2.2.8, respectively.

2.3 Analysis. Same as in Method 5, Section 2.3.

3. Reagents

The reagents for sampling, sample recovery, and analysis are the same as that specified in Method 5, Sections 3.1, 3.2, and 3.3, respectively.

4. Procedure

4.1 Sampling. The complexity of this method is such that, in order to obtain reliable results, testers should be trained and experienced with the test procedures.

4.1.1 Pretest Preparation. Same as in Method 5, Section 4.1.1.

4.1.2 Preliminary Determinations. Same as in Method 5, Section 4.1.2, except use the directions on nozzle size selection and sampling time in this method. Use of any nozzle greater than 0.16 in. in diameter requires a sampling port diameter of 6 inches. Also, the required maximum number of traverse points at any location shall be 12.

4.1.2.1 The sizing device must be in-stack or maintained at stack temperature during sampling. The blockage effect of the CSR sampling assembly will be minimal if the cross-sectional area of the sampling assembly is 3 percent or less of the cross-sectional area of the duct. If the cross-sectional area of the assembly is greater than 3 percent of the cross-sectional area of the duct, then either determine the pitot coefficient at sampling conditions or use a standard pitot with a known coefficient in a configuration with the CSR sampling assembly such that flow disturbances are minimized.

4.1.2.2 The setup calculations can be performed by using the following procedures.

4.1.2.2.1 In order to maintain a cut size of 10 μ m in the sizing device, the flow rate through the sizing device must be maintained at a constant, discrete value during the run. If the sizing device is a cyclone that meets the design specifications in Figure 3 of this method, use the equations in Figure 4 of this method to calculate three orifice heads (ΔH): one at the average stack temperature, and the other two at temperatures ± 28 °C (± 50 °F) of the average stack temperature. Use ΔH calculated at the average stack temperature as the pressure head for the sample flow rate as long as the stack temperature during the run is within 28 °C (50 °F) of the average stack temperature. If the stack temperature varies by more than 28 °C (50 °F), then use the appropriate ΔH.

4.1.2.2.2 If the sizing device is a cyclone that does not meet the design specifications in Figure 3 of this method, use the equations in Figure 4 of this method, except use the procedures in Section 5.3 of this method to determine Q_s, the correct cyclone flow rate for a 10 μ m size.

4.1.2.2.3 To select a nozzle, use the equations in Figure 5 of this method to calculate ΔP_{min} and ΔP_{max} for each nozzle at all three temperatures. If the sizing device is a cyclone that does not meet the design specifications in Figure 3 of this method, the example worksheets can be used.

4.1.2.2.4 Correct the Method 2 pitot readings to Method 201A pitot readings by multiplying the Method 2 pitot readings by the square of a ratio of the Method 201A pitot coefficient to the Method 2 pitot coefficient. Select the nozzle for which ΔP_{min} and ΔP_{max} bracket all of the corrected Method 2 pitot readings. If more than one nozzle meets this requirement, select the nozzle giving the greatest symmetry. Note that if the expected pitot reading for one or more points is near

a limit for a chosen nozzle, it may be outside the limits at the time of the run.

4.1.2.5 Vary the dwell time, or sampling time, at each traverse point proportionately with the point velocity. Use the equations in Figure 6 of this method to calculate the dwell time at the first point and at each subsequent point. It is recommended that the number of minutes sampled at each point be rounded to the nearest 15 seconds.

4.1.3 Preparation of Collection Train. Same as in Method 5, Section 4.1.3, except omit directions about a glass cyclone.

4.1.4 Leak-Check Procedure. The sizing device is removed before the post-test leak-check to prevent any disturbance of the collected sample prior to analysis.

4.1.4.1 Pretest Leak-Check. A pretest leak-check of the entire sampling train, including the sizing device, is required. Use the leak-check procedure in Method 5, Section 4.1.4.1 to conduct a pretest leak-check.

4.1.4.2 Leak-Checks During Sample Run. Same as in Method 5, Section 4.1.4.1.

4.1.4.3 Post-Test Leak-Check. A leak-check is required at the conclusion of each sampling run. Remove the cyclone before the leak-check to prevent the vacuum created by the cooling of the probe from disturbing the collected sample and use the procedure in Method 5, Section 4.1.4.3 to conduct a post-test leak-check.

4.1.5 Method 201A Train Operation. Same as in Method 5, Section 4.1.5, except use the procedures in this section for isokinetic sampling and flow rate adjustment. Maintain the flow rate calculated in Section 4.1.2.2.1 of this method throughout the run provided the stack temperature is within 28 °C (50 °F) of the temperature used to calculate ΔH . If stack temperatures vary by more than 28 °C (50 °F), use the appropriate ΔH value calculated in Section 4.1.2.2.1 of this method. Calculate the dwell time at each traverse point as in Figure 6 of this method.

4.2 Sample Recovery. If a cascade impactor is used, use the manufacturer's recommended procedures for sample recovery. If a cyclone is used, use the same sample recovery as that in Method 5, Section 4.2, except an increased number of sample recovery containers is required.

4.2.1 Container Number 1 (In-Stack Filter). The recovery shall be the same as that for Container Number 1 in Method 5, Section 4.2.

4.2.3 Container Number 2 (Cyclone or Large PM Catch). This step is optional. The anisokinetic error for the cyclone PM is theoretically larger than the error for the PM₁₀ catch. Therefore, adding all the fractions to get a total PM catch is not as accurate as Method 5 or Method 201. Disassemble the cyclone and remove the nozzle to recover the large PM catch. Quantitatively recover the PM from the interior surfaces of the nozzle and cyclone, excluding the "turn around" cup and the interior surfaces of the exit

tube. The recovery shall be the same as that for Container Number 2 in Method 5, Section 4.2.

4.2.4 Container Number 3 (PM₁₀). Quantitatively recover the PM from all of the surfaces from the cyclone exit to the front half of the in-stack filter holder, including the "turn around" cup inside the cyclone and the interior surfaces of the exit tube. The recovery shall be the same as that for Container Number 2 in Method 5, Section 4.2.

4.2.6 Container Number 4 (Silica Gel). The recovery shall be the same as that for Container Number 3 in Method 5, Section 4.2.

4.2.7 Impinger Water. Same as in Method 5, Section 4.2, under "Impinger Water."

4.3 Analysis. Same as in Method 5, Section 4.3, except handle Method 201A Container Number 1 like Container Number 1, Method 201A Container Numbers 2 and 3 like Container Number 2, and Method 201A Container Number 4 like Container Number 3. Use Figure 7 of this method to record the weights of PM collected. Use Figure 5-3 in Method 5, Section 4.3, to record the volume of water collected.

4.4 Quality Control Procedures. Same as in Method 5, Section 4.4.

4.5 PM₁₀ Emission Calculation and Acceptability of Results. Use the procedures in section 6 to calculate PM₁₀ emissions and the criteria in section 6.3.5 to determine the acceptability of the results.

5. Calibration

Maintain an accurate laboratory log of all calibrations.

5.1 Probe Nozzle, Pitot Tube, Metering System, Probe Heater Calibration, Temperature Gauges, Leak-check of Metering System, and Barometer. Same as in Method 5, Section 5.1 through 5.7, respectively.

5.2 Probe Cyclone and Nozzle Combinations. The probe cyclone and nozzle combinations need not be calibrated if both meet design specifications in Figures 2 and 3 of this method. If the nozzles do not meet design specifications, then test the cyclone and nozzle combinations for conformity with performance specifications (PS's) in Table 1 of this method. If the cyclone does not meet design specifications, then the cyclone and nozzle combination shall conform to the PS's and calibrate the cyclone to determine the relationship between flow rate, gas viscosity, and gas density. Use the procedures in Section 5.2 of this method to conduct PS tests and the procedures in Section 5.3 of this method to calibrate the cyclone. The purpose of the PS tests are to conform that the cyclone and nozzle combination has the desired sharpness of cut. Conduct the PS tests in a wind tunnel described in Section 5.2.1 of this method and particle generation system described in Section 5.2.2 of this method. Use five particle sizes and three wind velocities as listed in Table 2 of this method. A mini-

mum of three replicate measurements of collection efficiency shall be performed for each of the 15 conditions listed, for a minimum of 45 measurements.

5.2.1 Wind Tunnel. Perform the calibration and PS tests in a wind tunnel (or equivalent test apparatus) capable of establishing and maintaining the required gas stream velocities within 10 percent.

5.2.2 Particle Generation System. The particle generation system shall be capable of producing solid monodispersed dye particles with the mass median aerodynamic diameters specified in Table 2 of this method. Perform the particle size distribution verification on an integrated sample obtained during the sampling period of each test. An acceptable alternative is to verify the size distribution of samples obtained before and after each test, with both samples required to meet the diameter and monodispersity requirements for an acceptable test run.

5.2.2.1 Establish the size of the solid dye particles delivered to the test section of the wind tunnel by using the operating parameters of the particle generation system, and verify them during the tests by microscopic examination of samples of the particles collected on a membrane filter. The particle size, as established by the operating parameters of the generation system, shall be within the tolerance specified in Table 2 of this method. The precision of the particle size verification technique shall be at least ± 0.5 μm , and particle size determined by the verification technique shall not differ by more than 10 percent from that established by the operating parameters of the particle generation system.

5.2.2.2 Certify the monodispersity of the particles for each test either by microscopic inspection of collected particles on filters or by other suitable monitoring techniques such as an optical particle counter followed by a multichannel pulse height analyzer. If the proportion of multiplets and satellites in an aerosol exceeds 10 percent by mass, the particle generation system is unacceptable for the purpose of this test. Multiplets are

$$\sigma = \left[\frac{(E_1^2 + E_2^2 + E_3^2) - \frac{(E_1 + E_2 + E_3)^2}{3}}{2} \right]^{1/2}$$

If σ exceeds 0.10, repeat the replicated runs.

5.2.5.4 Measure the overall efficiency of the cyclone and nozzle, E_c , at the particle sizes and nominal gas velocities in Table 2 of this method using the following procedure.

5.2.5.5 Set the air velocity and particle size from one of the conditions in Table 2 of this method. Establish isokinetic sampling conditions and the correct flow rate in the

particles that are agglomerated, ellipses are particles that are smaller than the specified size range.

5.2.3 Schematic Drawings. Schematic drawings of the wind tunnel and blower system and other information showing complete procedural details of the test atmosphere generation, verification, and delivery techniques shall be furnished with calibration data to the reviewing agency.

5.2.4 Flow Measurements. Measure the cyclone air flow rates with a dry gas meter and a stopwatch, or a calibrated orifice system capable of measuring flow rates to within 2 percent.

5.2.5 Performance Specification Procedure. Establish test particle generator operation and verify particle size microscopically. If monodispersity is to be verified by measurements at the beginning and the end of the run rather than by an integrated sample, these measurements may be made at this time.

5.2.5.1 The cyclone cut size, or D_{50} , of a cyclone is defined here as the particle size having a 50 percent probability of penetration. Determine the cyclone flow rate at which D_{50} is 10 μm . A suggested procedure is to vary the cyclone flow rate while keeping a constant particle size of 10 μm . Measure the PM collected in the cyclone (m_c), the exit tube (m_e), and the filter (m_f). Calculate cyclone efficiency (E_c) for each flow rate as follows:

$$E_c = \frac{m_c}{(m_c + m_e + m_f)} \times 100$$

5.2.5.2 Do three replicates and calculate the average cyclone efficiency [$E_{c(avg)}$] as follows:

$$E_{c(avg)} = (E_1 + E_2 + E_3) / 3$$

Where E_1 , E_2 , and E_3 are replicate measurements of E_c .

5.2.5.3 Calculate the standard deviation (σ) for the replicate measurements of E_c as follows:

cyclone (obtained by procedures in this section) such that the D_{50} is 10 μm . Sample long enough to obtain ± 5 percent precision on total collected mass as determined by the precision and the sensitivity of measuring technique. Determine separately the nozzle catch (m_n), cyclone catch (m_c), cyclone exit tube (m_e), and collection filter catch (m_f) for each particle size and nominal gas velocity

In Table 2 of this method. Calculate overall efficiency (E_o) as follows:

$$E_o = \frac{(m_a + m_c)}{(m_a + m_c + m_i + m_r)} \times 100$$

5.2.5.6 Do three replicates for each combination of gas velocity and particle size in Table 2 of this method. Use the equation below to calculate the average overall efficiency [$E_{o(avg)}$] for each combination following the procedures described in this section for determining efficiency.

$$E_{o(avg)} = (E_1 + E_2 + E_3) / 3$$

Where E_1 , E_2 , and E_3 are replicate measurements of E_o .

5.2.5.7 Use the formula in Section 5.2.5.3 to calculate σ for the replicate measurements. If σ exceeds 0.10 or if the particle sizes and nominal gas velocities are not within the limits specified in Table 2 of this method, repeat the replicate runs.

5.2.6 Criteria for Acceptance. For each of the three gas stream velocities, plot the $E_{o(avg)}$ as a function of particle size on Figure 8 of this method. Draw smooth curves through all particle sizes. $E_{o(avg)}$ shall be within the banded region for all sizes, and the $E_{o(avg)}$ shall be 50±0.5 percent at 10 μ m.

5.3 Cyclone Calibration Procedure. The purpose of this procedure is to develop the relationship between flow rate, gas viscosity, gas density, and D_{50} .

5.3.1 Calculate Cyclone Flow Rate. Determine flow rates and D_{50} 's for three different

$$Q_c = \frac{\pi \mu}{4} \left[(3000)(K_1) - b \right]^{-0.5(m)} \left[\frac{T_s}{M_w P_s} \right]^{m/(m-0.5)} d^{(m-1.5)/(m-0.5)}$$

where:

m=Slope of the calibration line.

b=y-intercept of the calibration line.

Q_c =Cyclone flow rate for a cut size of 10 μ m, cm³/sec.

d=Diameter of nozzle, cm.

T_s =Stack gas temperature, °R.

P_s =Absolute stack pressure, in. Hg.

M_w =Wet molecular weight of the stack gas, lb/lb-mole.

$K_1=4.077 \times 10^{-3}$.

5.3.1.3 Refer to the Method 201A operators manual, entitled *Application Guide for Source PM₁₀ Measurement with Constant Sampling Rate*, for directions in the use of this equation for Q in the setup calculations.

5.4 Cascade Impactor. The purpose of calibrating a cascade impactor is to determine the empirical constant (Stk_{50}), which is specific to the impactor and which permits the accurate determination of the cut size of the

particle sizes between 5 μ m and 15 μ m, one of which shall be 10 μ m. All sizes must be determined within 0.5 μ m. For each size, use a different temperature within 80 °C (108 °F) of the temperature at which the cyclone is to be used and conduct triplicate runs. A suggested procedure is to keep the particle size constant and vary the flow rate.

5.3.1.1 On log-log graph paper, plot the Reynolds number (Re) on the abscissa, and the square root of the Stokes 50 number [$(Stk_{50})^{1/2}$] on the ordinate for each temperature. Use the following equations to compute both values:

$$Re = \frac{4 \rho Q_{cyc}}{d_{cyc} \pi \mu_s}$$

$$(Stk_{50})^{1/2} = \left[\frac{4 Q_{cyc} (D_{50})^2}{9 \pi \mu_s (d_{cyc})^3} \right]^{1/2}$$

where:

Q_{cyc} =Cyclone flow rate, cm³/sec.

ρ =Gas density, g/cm³.

d_{cyc} =Diameter of cyclone inlet, cm.

μ_s =Viscosity of stack gas, micropoise.

D_{50} =Aerodynamic diameter of a particle having a 50 percent probability of penetration, cm.

5.3.1.2 Use a linear regression analysis to determine the slope (m) and the Y-intercept (b). Use the following formula to determine Q_c , the cyclone flow rate required for a cut size of 10 μ m.

impactor stages at field conditions. It is not necessary to calibrate each individual impactor. Once an impactor has been calibrated, the calibration data can be applied to other impactors of identical design.

5.4.1 Wind Tunnel. Same as in Section 5.2.1 of this method.

5.4.2 Particle Generation System. Same as in Section 5.2.2 of this method.

5.4.3 Hardware Configuration for Calibrations. An impaction stage constrains an aerosol to form circular or rectangular jets which are directed toward a suitable substrate where the larger aerosol particles are collected. For calibration purposes, three stages of the cascade impactor shall be discussed and designated calibration stages 1, 2 and 3. The first calibration stage consists of the collection substrate of an impactor stage and all upstream surfaces up to and including the nozzle. This may include other

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preceding impactor stages. The second and third calibration stages consist of each respective collection substrate and all upstream surfaces up to but excluding the collection substrate of the preceding calibration stage. This may include intervening impactor stages which are not designated as calibration stages. The cut size, or D_{50} , of the adjacent calibration stages shall differ by a factor of not less than 1.5 and not more than 10. For example, if the first calibration stage has a D_{50} of 12 μ m, then the D_{50} of the downstream stage shall be between 6 and 8 μ m.

5.4.3.1 It is expected, but not necessary, that the complete hardware assembly will be used in each of the sampling runs of the calibration and performance determinations. Only the first calibration stage must be tested under isokinetic sampling conditions. The second and third calibration stages must be calibrated with the collection substrate of the preceding calibration stage in place, so that gas flow patterns existing in field operation will be simulated.

5.4.3.2 Each of the PM₁₀ stages should be calibrated with the type of collection substrate, viscous material (such as grease) or glass fiber, used in PM₁₀ measurements. Note that most materials used as substrates at elevated temperatures are not viscous at normal laboratory conditions. The substrate material used for calibrations should minimize particle bounce, yet be viscous enough to withstand erosion or deformation by the impactor jets and not interfere with the procedure for measuring the collected PM.

5.4.4 Calibration Procedure. Establish test particle generator operation and verify particle size microscopically. If monodispersity is to be verified by measurements at the beginning and the end of the run rather than by an integrated sample, these measurements shall be made at this time. Measure in triplicate the PM collected by the calibration stage (m) and the PM on all surfaces downstream of the respective calibration stage (m') for all of the flow rates and particle size combinations shown in Table 2 of this method. Techniques of mass measurement may include the use of a dye and spectrophotometer. Particles on the upstream side of a jet plate shall be included with the substrate downstream, except agglomerates of particles, which shall be included with the preceding or upstream substrate. Use the following formula to calculate the collection efficiency (E) for each stage.

5.4.4.1 Use the formula in Section 5.2.5.3 of this method to calculate the standard deviation (σ) for the replicate measurements. If σ exceeds 0.10, repeat the replicate runs.

5.4.4.2 Use the following formula to calculate the average collection efficiency (E_{avg}) for each set of replicate measurements.

$$E_{avg} = (E_1 + E_2 + E_3) / 3$$

where E_1 , E_2 , and E_3 are replicate measurements of E .

5.4.4.3 Use the following formula to calculate Stk for each E_{avg} .

$$Stk = \frac{D^2 Q}{9 \mu A d_j}$$

where:

D=Aerodynamic diameter of the test particle, cm (g/cm³)^{1/2}.

Q=Gas flow rate through the calibration stage at inlet conditions, cm³/sec.

μ =Gas viscosity, micropoise.

A=Total cross-sectional area of the jets of the calibration stage, cm².

d_j =Diameter of one jet of the calibration stage, cm.

5.4.4.4 Determine Stk_{50} for each calibration stage by plotting E_{avg} versus Stk on log-log paper. Stk_{50} is the Stk number at 50 percent efficiency. Note that particle bounce can cause efficiency to decrease at high values of Stk. Thus, 50 percent efficiency can occur at multiple values of Stk. The calibration data should clearly indicate the value of Stk_{50} for minimum particle bounce. Impactor efficiency versus Stk with minimal particle bounce is characterized by a monotonically increasing function with constant or increasing slope with increasing Stk.

5.4.4.5 The Stk_{50} of the first calibration stage can potentially decrease with decreasing nozzle size. Therefore, calibrations should be performed with enough nozzle sizes to provide a measured value within 25 percent of any nozzle size used in PM₁₀ measurements.

5.4.5 Criteria For Acceptance. Plot E_{avg} for the first calibration stage versus the square root of the ratio of Stk to Stk_{50} on Figure 9 of this method. Draw a smooth curve through all of the points. The curve shall be within the banded region.

6. Calculations

Calculations are as specified in Method 5, sections 6.3 through 6.7, and 6.9 through 6.11, with the addition of the following:

6.1 Nomenclature.

B_w =Moisture fraction of stack, by volume, dimensionless.

C_1 =Viscosity constant, 51.12 micropoise for °K (51.05 micropoise for °R).

C_2 =Viscosity constant, 0.372 micropoise/°K (0.207 micropoise/°R).

C_3 =Viscosity constant, 1.05×10^{-4} micropoise/°K² (3.24×10^{-5} micropoise/°R²).

C_4 =Viscosity constant, 53.147 micropoise/fraction O₂.

C_5 =Viscosity constant, 74.143 micropoise/fraction H₂O.

D_{50} =Diameter of particles having a 50 percent probability of penetration, μm .
 f_c =Stack gas fraction O_2 , by volume, dry basis.
 $K_1=0.3858 \text{ } ^\circ\text{K}/\text{mm Hg}$ ($17.64 \text{ } ^\circ\text{R}/\text{in. Hg}$).
 M_w =Wet molecular weight of stack gas, g/g-mole (lb/lb-mole).
 M_d =Dry molecular weight of stack gas, g/g-mole (lb/lb-mole).
 P_{bm} =Barometric pressure at sampling site, mm Hg (in. Hg).
 P_s =Absolute stack pressure, mm Hg (in. Hg).
 Q_c =Total cyclone flow rate at wet cyclone conditions, m^3/min (ft^3/min).
 $Q_{c(std)}$ =Total cyclone flow rate at standard conditions, dscm/min (dscf/min).
 T_m =Average absolute temperature of dry meter, $^\circ\text{K}$ ($^\circ\text{R}$).
 T_s =Average absolute stack gas temperature, $^\circ\text{K}$ ($^\circ\text{R}$).
 $V_{w(std)}$ =Volume of water vapor in gas sample (standard conditions), scm (scf).
 t =Total sampling time, min.
 μ =Viscosity of stack gas, micropoise.

6.2 Analysis of Cascade Impactor Data. Use the manufacturer's recommended procedures to analyze data from cascade impactors.

6.3 Analysis of Cyclone Data. Use the following procedures to analyze data from a single stage cyclone.

6.3.1 PM_{10} Weight. Determine the PM catch in the PM_{10} range from the sum of the weights obtained from Container Numbers 1 and 3 less the acetone blank.

6.3.2 Total PM Weight (optional). Determine the PM catch for greater than PM_{10} from the weight obtained from Container Number 2 less the acetone blank, and add it to the PM_{10} weight.

6.3.3 PM_{10} Fraction. Determine the PM_{10} fraction of the total particulate weight by dividing the PM_{10} particulate weight by the total particulate weight.

6.3.4 Aerodynamic Cut Size. Calculate the stack gas viscosity as follows:

$$\mu = C_1 + C_2 T_s + C_3 T_s^2 + C_4 f_{\text{O}_2} - C_5 B_w$$

6.3.4.1 The PM_{10} flow rate, at actual cyclone conditions, is calculated as follows:

$$Q_c = \frac{T_s}{K_1 P_s} \left[Q_{c(std)} + \frac{V_{w(std)}}{\theta} \right]$$

6.3.4.2 Calculate the molecular weight on a wet basis of the stack gas as follows:

$$M_w = M_d(1 - B_w) + 18.0(B_w)$$

6.3.4.3 Calculate the actual D_{50} of the cyclone for the given conditions as follows:

$$D_{50} = \beta_1 \left[\frac{T_s}{M_w P_s} \right]^{0.2091} \left[\frac{\mu}{Q_c} \right]^{0.7091}$$

where $\beta_1 = 0.027754$ for metric units (0.15635 for English units).

6.3.5 Acceptable Results. The results are acceptable if two conditions are met. The first is that $9.0 \mu\text{m} \leq D_{50} \leq 11.0 \mu\text{m}$. The second is that no sampling points are outside ΔP_{min} and ΔP_{max} , or that 80 percent $\leq I \leq 120$ percent and no more than one sampling point is outside ΔP_{min} and ΔP_{max} . If D_{50} is less than $9.0 \mu\text{m}$, reject the results and repeat the test.

7. Bibliography

- Same as Bibliography in Method 5.
- McCain, J.D., J.W. Ragland, and A.D. Williamson. Recommended Methodology for the Determination of Particle Size Distributions in Ducted Sources, Final Report. Prepared for the California Air Resources Board by Southern Research Institute. May 1986.
- Farthing, W.E., S.S. Dawes, A.D. Williamson, J.D. McCain, R.S. Martin, and J.W. Ragland. Development of Sampling Methods for Source PM_{10} Emissions. Southern Research Institute for the Environmental Protection Agency. April 1989. NTIS PB 89 190375, EPA/600/3-88-056.
- Application Guide for Source PM_{10} Measurement with Constant Sampling Rate, EPA/600/3-88-057.

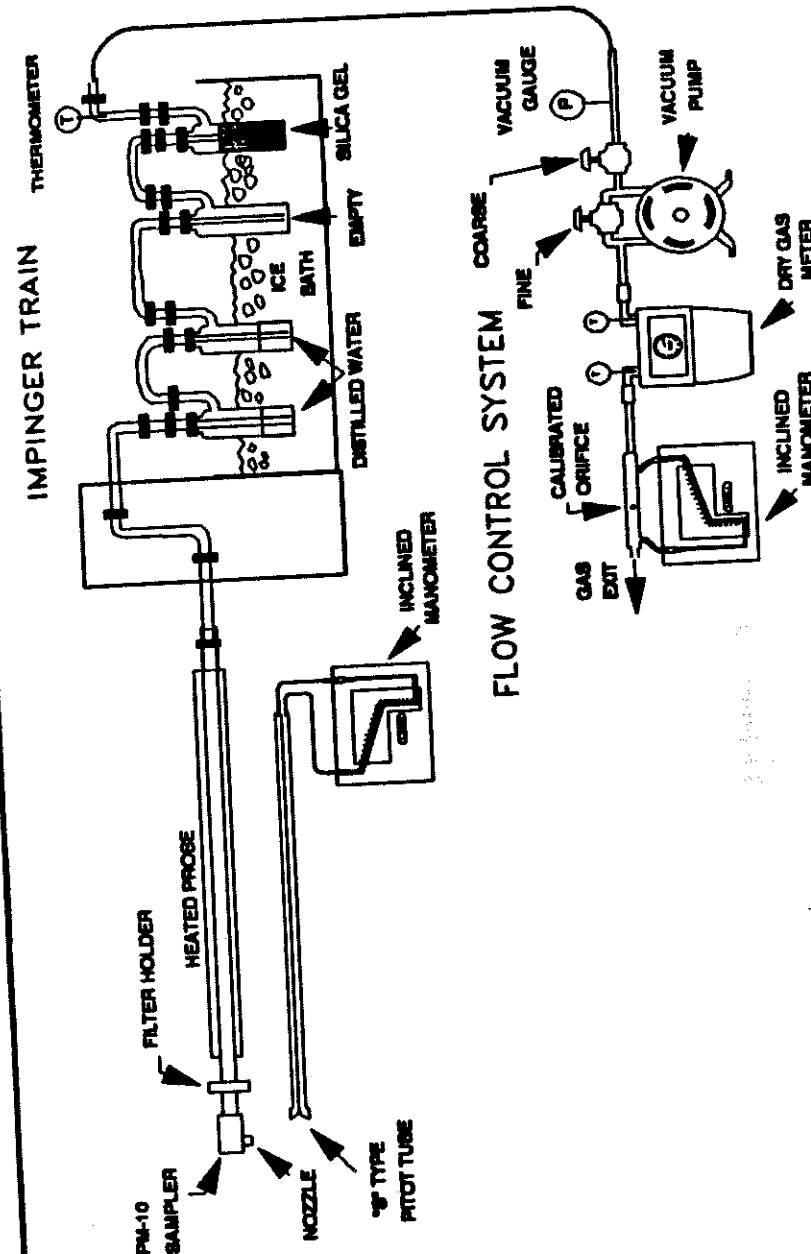
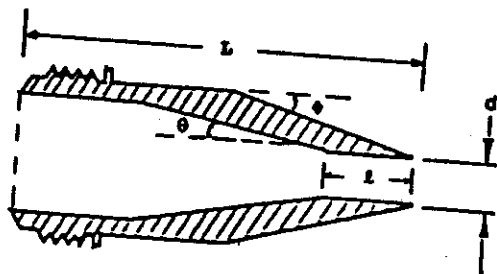


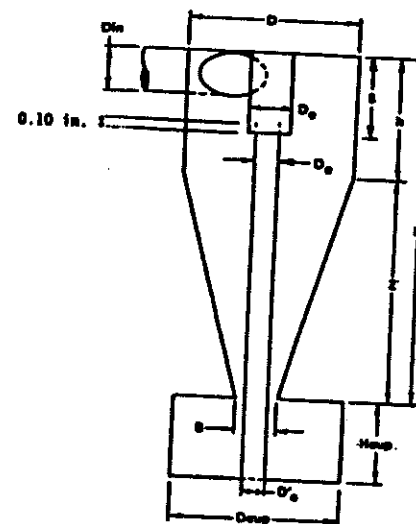
Figure 1. CSR Sampling Train



Nozzle Diameter (inches)	Cone Angle, θ (degrees)	Outside taper, ϕ (degrees)	Straight inlet length, l (inches)	Total Length L (inches)
0.136	4	15	<0.05	2.653 \pm 0.05
0.150	4	15	<0.05	2.553 \pm 0.05
0.164	5	15	<0.05	1.970 \pm 0.05
0.180	6	15	<0.05	1.572 \pm 0.05
0.197	6	15	<0.05	1.491 \pm 0.05
0.215	6	15	<0.05	1.45 \pm 0.05
0.233	6	15	<0.05	1.45 \pm 0.05
0.264	5	15	<0.05	1.48 \pm 0.05
0.300	4	15	<0.05	1.45 \pm 0.05
0.342	4	15	<0.05	1.45 \pm 0.05
0.390	3	15	<0.05	1.45 \pm 0.05

Figure 2. Nozzle design specifications.

Cyclone Interior Dimensions



		Dimensions (± 0.02 cm, ± 0.01 in.)											
cm		Dm	D	Dc	H	Z	S	Hcup	Dcup	Dc	Dp		
inches		1.27	4.47	1.58	1.88	0.95	2.24	4.71	1.57	2.25	4.45	1.82	1.24
		0.50	1.78	0.59	0.74	2.74	0.88	1.85	0.62	0.89	1.75	0.48	0.49

Figure 3. Cyclone design specifications.

Barometric pressure,
 P_{bar} , in. Hg = _____
 Stack static pressure,
 P_s , in. H₂O = _____
 Average stack temperature,
 t_s , °F = _____
 Meter temperature, t_m , °F = _____
 Orifice ΔH_o , in. H₂O = _____
 Gas analysis:
 %CO₂ = _____
 %O₂ = _____
 %N₂+%CO = _____
 Fraction moisture content,
 B_{ws} = _____
 Molecular weight of stack gas, dry basis:

$M_d=0.44$ (%CO₂)+0.32 (%O₂)+0.24 (%N₂+%CO)= _____ lb/lb mole
 Molecular weight of stack gas, wet basis:
 $M_w=M_d(1-B_{ws})+18(B_{ws})=$ _____ lb/lb mole
 Absolute stack pressure:
 $P_s=P_{bar}+ \frac{P_s}{13.6} =$ _____ in. Hg
 Viscosity of stack gas:
 $\mu_s=152.418+0.2552 t_s+3.2355 \times 10^{-5} t_s^2+0.5317$
 (%O₂)-74.143 B_{ws} = _____ micropoise
 Cyclone flow rate:

$$Q_s=0.002837 \mu_s \left[\frac{(t_s+460)}{M_w P_s} \right] 0.2949 = \text{_____ ft}^3/\text{min}$$

Figure 4. Example worksheet 1, cyclone flow rate and ΔH .
 Orifice pressure head (ΔH) needed for cyclone flow rate:

$$\Delta H = \left[\frac{Q_s (1-B_{ws}) P_s}{t_s+460} \right]^2 \frac{M_d 1.083 \Delta H_o}{P_{bar}} = \text{_____ in. H}_2\text{O}$$

Calculate ΔH for three temperatures:

t_s , °F			
ΔH , in. H ₂ O			

Stack viscosity, μ_s ,
 micropoise = _____
 Absolute stack pressure,
 P_s , in. Hg = _____
 Average stack temperature,
 t_s , °F = _____
 Meter temperature, t_m , °F = _____

Method 201A pitot coefficient,
 $C_p =$ _____
 Cyclone flow rate, ft³/min,
 $Q_s =$ _____
 Method 2 pitot coefficient,
 $C_p' =$ _____
 Molecular weight of stack gas, wet basis,
 $M_w =$ _____
 Nozzle diameter, D_n , in. = _____
 Nozzle velocity:

$$v_n = \frac{3.056 Q_s}{D_n^2} = \text{_____ ft/sec}$$

$$v_{min} = v_n \left[0.2457 + \left[0.3072 - \frac{0.2603 Q_s^{1/2} \mu_s}{v_n^{1.5}} \right]^{1/2} \right] = \text{_____ ft/sec}$$

$$v_{max} = v_n \left[0.4457 + \left[0.5690 - \frac{0.2603 Q_s^{1/2} \mu_s}{v_n^{1.5}} \right]^{1/2} \right] = \text{_____ ft/sec}$$

Maximum and minimum velocities:
 Calculate R_{min}

$$R_{min} = 0.2457 +$$

$$0.3072 - \frac{0.2603(\sqrt{Q_s}) \mu_s}{v_n^{1.5}} =$$

If R_{min} is less than 0.5, or if an imaginary number occurs when calculating

R_{min} , use Equation 1 to calculate v_{min} .
 Otherwise, use Equation 2.
 Eq. 1 $v_{min} = v_n (0.5) =$ _____ ft/sec
 Eq. 2 $v_{min} = v_n R_{min} =$ _____ ft/sec
 Calculate R_{max} .

$$R_{max} = 0.4457 +$$

$$0.5690 + \frac{0.2603(\sqrt{Q_s}) \mu_s}{v_n^{1.5}} =$$

If R_{max} is greater than 1.5, use Equation 3 to calculate v_{max} . Otherwise, use Equation 4.
 Eq. 3 $v_{max} = v_n (1.5) =$ _____ ft/sec
 Eq. 4 $v_{max} = v_n R_{max} =$ _____ ft/sec

Figure 5. Example worksheet 2, nozzle selection.

Maximum and minimum velocity head values:

$$\Delta p_{min} = 1.3686 \times 10^{-4} \frac{P_s M_w (v_{min})^2}{(t_s + 460) C_p^2} = \text{_____ in. H}_2\text{O}$$

$$\Delta p_{max} = 1.3686 \times 10^{-4} \frac{P_s M_w (v_{max})^2}{(t_s + 460) C_p^2} = \text{_____ in. H}_2\text{O}$$

Nozzle No.						Nozzle No.					
D_n , in.	.....	.....	.....	.....	.....	Δp_{min} , in. H ₂ O	.....	.....	.....	.....	.....
v_n , ft/sec	.....	.....	.....	.....	.....	Δp_{max} , in. H ₂ O	.....	.....	.....	.....	.....
v_{min} , ft/sec	.....	.....	.....	.....	.....	Velocity traverse data:					
v_{max} , ft/sec	.....	.....	.....	.....	.....	

$$\Delta p(\text{Method 201A}) = \Delta p(\text{Method 2}) \left[\frac{C_p}{C_p'} \right]^2$$

Total run time, minutes = _____
 Number of traverse points = _____

$$t_1 = \left[\frac{\Delta p_1}{\Delta p_{avg}} \right]^{1/2} \frac{(\text{Total run time})}{(\text{Number of points})}$$

where:

$$t_n = \frac{t_1}{(\Delta p_1)^{1/2}} (\Delta p_n)^{1/2}, n=2,3, \dots \text{total number of sampling points}$$

where:

t_n =dwell time at traverse point n, minutes.

t_1 =dwell time at first traverse point, minutes.
 Δp_1 =the velocity head at the first traverse point (from a previous traverse), in. H₂O.
 Δp_{avg} =the square of the average square root of the Δp 's (from a previous velocity traverse), in. H₂O.
 At subsequent traverse points, measure the velocity Δp and calculate the dwell time by using the following equation:

Δp_n =measured velocity head at point n, in. H₂O.
 Δp_1 =measured velocity head at point 1 in. H₂O.

Figure 6. Example worksheet 3, dwell time.

Point No.	Port							
	Δp	t	Δp	t	Δp	t	Δp	t
1								
2								
3								
4								
5								
6								

Plant _____
 Date _____
 Run no. _____
 Filter no. _____
 Amount of liquid lost during transport _____
 Acetone blank volume, ml _____
 Acetone wash volume, ml (4) _____
 (5) _____
 Acetone blank conc., mg/mg (Equation 5-4, Method 5) _____
 Acetone wash blank, mg (Equation 5-5, Method 5) _____

Container No.	Weight of PM ₁₀ (mg)		
	Final weight	Tare weight	Weight gain
1			
3			
Total			
Less acetone blank			
Weight of PM ₁₀			

Figure 7. Method 201A analysis sheet.

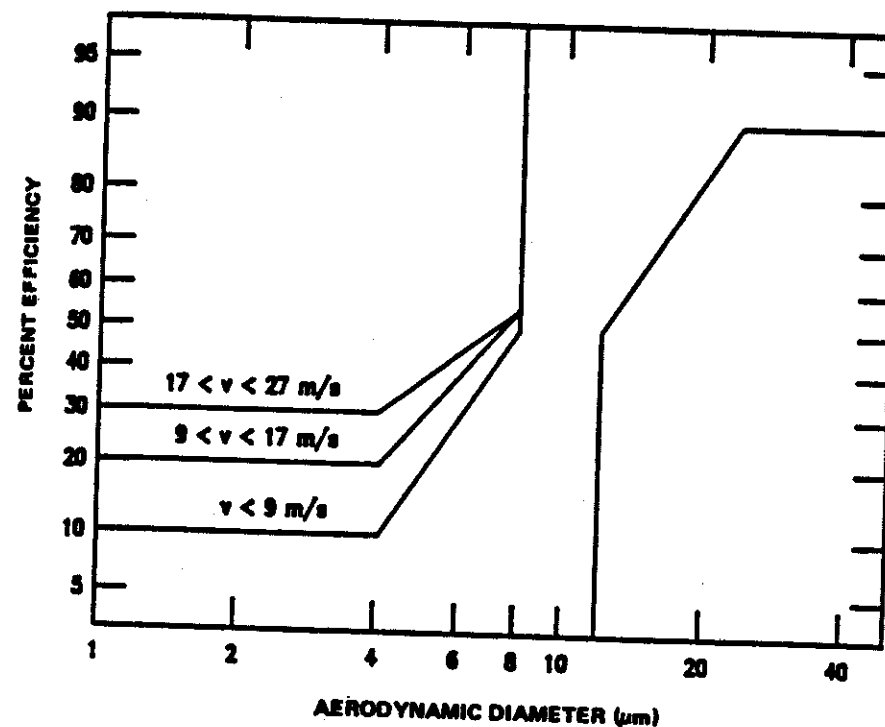
TABLE 1.—PERFORMANCE SPECIFICATIONS FOR SOURCE PM₁₀ CYCLONES AND NOZZLE COMBINATIONS

Parameter	Units	Specifications
1. Collection efficiency.	Percent	Such that collection efficiency falls within envelope specified by Section 5.2.6 and Figure 8.
2. Cyclone cut size (D ₅₀).	μm	10 \pm 1 μm aerodynamic diameter.

TABLE 2.—PARTICLE SIZES AND NOMINAL GAS VELOCITIES FOR EFFICIENCY

Particle size (μm) ^a	Target gas velocities (m/sec)		
	7 \pm 1.0	15 \pm 1.5	25 \pm 2.5
5 \pm 0.5			
7 \pm 0.5			
10 \pm 0.5			
14 \pm 1.0			
20 \pm 1.0			

(^a) Mass median aerodynamic diameter.

Figure 8. Efficiency envelope for the PM₁₀ cyclone.

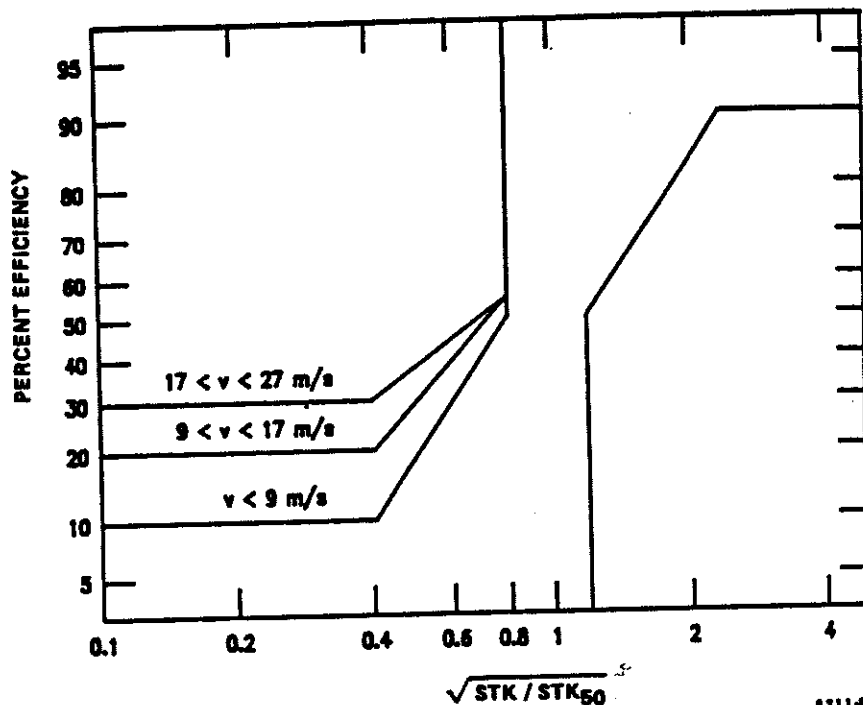


Figure 9. Efficiency envelope for first calibration stage.

[55 FR 14249, Apr. 17, 1990; 55 FR 24687, June 18, 1990, as amended at 55 FR 37607, Sept. 10, 1990; 56 FR 6278, Feb. 15, 1991]

1. Applicability and Principle

1.1 Applicability. 1.1.1 This method applies to the determination of condensible particulate matter (CPM) emissions from stationary sources. It is intended to represent condensible matter as material that condenses after passing through a filter and as measured by this method (Note: The filter catch can be analyzed according to the appropriate method).

1.1.2 This method may be used in conjunction with Method 201 or 201A if the probes are glass-lined. Using Method 202 in conjunction with Method 201 or 201A, only the impinger train configuration and analysis is addressed by this method. The sample train operation and front end recovery and analysis shall be conducted according to Method 201 or 201A.

1.1.3 This method may also be modified to measure material that condenses at other temperatures by specifying the filter and probe temperature. A heated Method 5 out-of-stack filter may be used instead of the in-stack filter to determine condensible emissions at wet sources.

1.2 Principle. 1.2.1 The CPM is collected in the impinger portion of a Method 17 (appendix A, 40 CFR part 60) type sampling train. The impinger contents are immediately purged after the run with nitrogen (N_2) to remove dissolved sulfur dioxide (SO_2) gases from the impinger contents. The impinger solution is then extracted with methylene chloride ($MeCl_2$). The organic and aqueous fractions are then taken to dryness and the residues weighed. The total of both fractions represents the CPM.

1.2.2 The potential for low collection efficiency exist at oil-fired boilers. To improve the collection efficiency at these type of sources, an additional filter placed between the second and third impinger is recommended.

2. Precision and Interference

2.1 Precision. The precision based on method development tests at an oil-fired boiler and a catalytic cracker were 11.7 and 13 percent, respectively.

2.2 Interference. Ammonia. In sources that use ammonia injection as a control technique for hydrogen chloride (HCl), the ammonia interferes by reacting with HCl in the gas stream to form ammonium chloride (NH_4Cl) which would be measured as CPM. The sample may be analyzed for chloride and the equivalent amount of NH_4Cl can be subtracted from the CPM weight. However, if NH_4Cl is to be counted as CPM, the inorganic fraction should be taken to near dryness (less than 1 ml liquid) in the oven and

then allowed to air dry at ambient temperature to prevent any NH_4Cl from vaporizing.

3. Apparatus

3.1 Sampling Train. Same as in Method 17, section 2.1, with the following exceptions noted below (see Figure 202-1). Note: Mention of trade names or specific products does not constitute endorsement by EPA.

3.1.1 The probe extension shall be glass-lined or Teflon.

3.1.2 Both the first and second impingers shall be of the Greenburg-Smith design with the standard tip.

3.1.3 All sampling train glassware shall be cleaned prior to the test with soap and tap water, water, and rinsed using tap water, water, acetone, and finally, $MeCl_2$. It is important to completely remove all silicone grease from areas that will be exposed to the $MeCl_2$ during sample recovery.

3.2 Sample Recovery. Same as in Method 17, section 2.2, with the following additions:

3.2.1 N_2 Purge Line. Inert tubing and fittings capable of delivering 0 to 28 liters/min of N_2 gas to the impinger train from a standard gas cylinder (see Figure 202-2). Standard 0.95 cm (3/8-inch) plastic tubing and compression fittings in conjunction with an adjustable pressure regulator and needle valve may be used.

3.2.2 Rotameter. Capable of measuring gas flow at 20 liters/min.

3.3 Analysis. The following equipment is necessary in addition to that listed in Method 17, section 2.3:

3.3.1 Separatory Funnel. Glass, 1-liter.

3.3.2 Weighing Tins. 360-ml.

3.3.3 Dry Equipment. Hot plate and oven with temperature control.

3.3.4 Pipets. 5-ml.

3.3.5 Ion Chromatograph. Same as in Method 5F, Section 2.1.6.

4. Reagents

Unless otherwise indicated, all reagents must conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society. Where such specifications are not available, use the best available grade.

4.1 Sampling. Same as in Method 17, section 3.1, with the addition of deionized distilled water to conform to the American Society for Testing and Materials Specification D 1193-74, Type II and the omission of section 3.1.4.

4.2 Sample Recovery. Same as in Method 17, section 3.2, with the following additions:

4.2.1 N_2 Gas. Zero N_2 gas at delivery pressures high enough to provide a flow of 20 liters/min for 1 hour through the sampling train.

4.2.2 Methylene Chloride. ACS grade. Blanks shall be run prior to use and only

methylene chloride with low blank values (0.001 percent) shall be used.

4.2.3 Water. Same as in section 4.1.

4.3 Analysis. Same as in Method 17, section 3.3, with the following additions:

4.3.1 Methylene Chloride. Same as section 4.2.2.

4.3.2 Ammonium Hydroxide. Concentrated (14.8 M) NH_4OH .

4.3.3 Water. Same as in section 4.1.

4.3.4 Phenolphthalein. The pH indicator solution, 0.05 percent in 50 percent alcohol.

5. Procedure

5.1 Sampling. Same as in Method 17, section 4.1, with the following exceptions:

5.1.1 Place 100 ml of water in the first three impingers.

5.1.2 The use of silicone grease in train assembly is not recommended because it is very soluble in MeCl_2 which may result in sample contamination. Teflon tape or similar means may be used to provide leak-free connections between glassware.

5.2 Sample Recovery. Same as in Method 17, section 4.2 with the addition of a post-test N_2 purge and specific changes in handling of individual samples as described below.

5.2.1 Post-test N_2 Purge for Sources Emitting SO_2 . (Note: This step is recommended, but is optional. With little or no SO_2 is present in the gas stream, i.e., the pH of the impinger solution is greater than 4.5, purging has been found to be unnecessary.) As soon as possible after the post-test leak check, detach the probe and filter from the impinger train. Leave the ice in the impinger box to prevent removal of moisture during the purge. If necessary, add more ice during the purge to maintain the gas temperature below 20 °C. With no flow of gas through the clean purge line and fittings, attach it to the input of the impinger train (see Figure 202-2). To avoid over- or underpressurizing the impinger array, slowly commence the N_2 gas flow through the line while simultaneously opening the meter box pump valve(s). When using the gas cylinder pressure to push the purge gas through the sample train, adjust the flow rate to 20 liters/min through the rotameter. When pulling the purge gas through the sample train using the meter box vacuum pump, set the orifice pressure differential to ΔH_0 and maintain an overflow rate through the rotameter of less than 2 liters/min. This will guarantee that the N_2 delivery system is operating at greater than ambient pressure and prevents the possibility of passing ambient air (rather than N_2) through the impingers. Continue the purge under these conditions for 1 hour, checking the rotameter and ΔH value(s) periodically. After 1 hour, simultaneously turn off the delivery and pumping systems.

5.2.2 Sample Handling.

5.2.2.1 Container Nos. 1, 2, and 3. If filter catch is to be determined, as detailed in Method 17, section 4.2.

5.2.2.2 Container No. 4 (Impinger Contents). Measure the liquid in the first three impingers to within 1 ml using a clean graduated cylinder or by weighing it to within 0.1 g using a balance. Record the volume or weight of liquid present to be used to calculate the moisture content of the effluent gas. Quantitatively transfer this liquid into a clean sample bottle (glass or plastic); rinse each impinger and the connecting glassware, including probe extension, twice with water, recover the rinse water, and add it to the same sample bottle. Mark the liquid level on the bottle.

5.2.2.3 Container No. 5 (MeCl_2 Rinse). Follow the water rinses of each impinger and the connecting glassware, including the probe extension with two rinses of MeCl_2 ; save the rinse products in a clean, glass sample jar. Mark the liquid level on the jar.

5.2.2.4 Container No. 6 (Water Blank). Once during each field test, place 500 ml of water in a separate sample container.

5.2.2.5 Container No. 7 (MeCl_2 Blank). Once during each field test, place in a separate glass sample jar a volume of MeCl_2 approximately equivalent to the volume used to conduct the MeCl_2 rinses of the impingers.

5.3 Analysis. Record the data required on a sheet such as the one shown in Figure 202-3. Handle each sample container as follows:

5.3.1 Container Nos. 1, 2, and 3. If filter catch is analyzed, as detailed in Method 17, section 4.3.

5.3.2 Container Nos. 4 and 5. Note the level of liquid in the containers and confirm on the analytical data sheet whether leakage occurred during transport. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results. Measure the liquid in Container No. 4 either volumetrically to ± 1 ml or gravimetrically to ± 0.5 g. Remove a 5-ml aliquot and set aside for later ion chromatographic (IC) analysis of sulfates. (Note: Do not use this aliquot to determine chlorides since the HCl will be evaporated during the first drying step; Section 8.2 details a procedure for this analysis.)

5.3.2.1 Extraction. Separate the organic fraction of the sample by adding the contents of Container No. 4 (MeCl_2) to the contents of Container No. 4 in a 1000-ml separatory funnel. After mixing, allow the aqueous and organic phases to fully separate, and drain off most of the organic/ MeCl_2 phase. Then add 75 ml of MeCl_2 to the funnel, mix well, and drain off the lower organic phase. Repeat with another 75 ml of MeCl_2 . This extraction should yield about 250 ml of organic extract. Each time, leave a small amount of the organic/ MeCl_2 phase in the separatory funnel ensuring that no water is

collected in the organic phase. Place the organic extract in a tared 350-ml weighing tin.

5.3.2.2 Organic Fraction Weight Determination (Organic Phase from Container Nos. 4 and 5). Evaporate the organic extract at room temperature and pressure in a laboratory hood. Following evaporation, desiccate the organic fraction for 24 hours in a desiccator containing anhydrous calcium sulfate. Weigh to a constant weight and report the results to the nearest 0.1 mg.

5.3.2.3 Inorganic Fraction Weight Determination. (Note: If NH_4Cl is to be counted as CPM, the inorganic fraction should be taken to near dryness (less than 1 ml liquid) in the oven and then allow to air dry at ambient temperature. If multiple acid emissions are suspected, the ammonia titration procedure in section 8.1 may be preferred.) Using a hot plate, or equivalent, evaporate the aqueous phase to approximately 50 ml; then, evaporate to dryness in a 105 °C oven. Redissolve the residue in 100 ml of water. Add five drops of phenolphthalein to this solution; then, add concentrated (14.8 M) NH_4OH until the sample turns pink. Any excess NH_4OH will be evaporated during the drying step. Evaporate the sample to dryness in a 105 °C oven, desiccate the sample for 24 hours, weigh to a constant weight, and record the results to the nearest 0.1 mg. (Note: The addition of NH_4OH is recommended, but is optional when little or no SO_2 is present in the gas stream, i.e., when the pH of the impinger solution is greater than 4.5, the addition of NH_4OH is not necessary.)

5.3.2.4 Analysis of Sulfate by IC to Determine Ammonium Ion (NH_4^+) Retained in the Sample. (Note: If NH_4OH is not added, omit this step.) Determine the amount of sulfate in the aliquot taken from Container No. 4 earlier as described in Method 5F (appendix A, 40 CFR part 60). Based on the IC SO_4^{2-} analysis of the aliquot, calculate the correction factor to subtract the NH_4^+ retained in the sample and to add the combined water removed by the acid-base reaction (see section 7.2).

5.3.3 Analysis of Water and MeCl_2 Blanks (Container Nos. 6 and 7). Analyze these sample blanks as described above in sections 5.3.2.3 and 5.3.2.2, respectively.

5.3.4 Analysis of Acetone Blank (Container No. 8). Same as in Method 17, section 4.3.

6. Calibration

Same as in Method 17, section 5, except for the following:

6.1 IC Calibration. Same as Method 5F, section 5.

6.2 Audit Procedure. Concurrently, analyze the audit sample and a set of compliance samples in the same manner to evaluate the technique of the analyst and the standards preparation. The same analyst, analytical reagents, and analytical system

shall be used both for compliance samples and the EPA audit sample. If this condition is met, auditing of subsequent compliance analyses for the same enforcement agency within 30 days is not required. An audit sample set may not be used to validate different sets of compliance samples under the jurisdiction of different enforcement agencies, unless prior arrangements are made with both enforcement agencies.

6.3 Audit Samples. Audit Sample Availability. Audit samples will be supplied only to enforcement agencies for compliance tests. The availability of audit samples may be obtained by writing:

Source Test Audit Coordinator (MD-77B), Quality Assurance Division, Atmospheric Research and Exposure Assessment Laboratory, U.S. Environmental Protection Agency, Research Triangle, Park, NC 27711

or by calling the Source Test Audit Coordinator (STAC) at (919) 541-7834. The request for the audit sample must be made at least 30 days prior to the scheduled compliance sample analysis.

6.4 Audit Results. Calculate the audit sample concentration according to the calculation procedure described in the audit instructions included with the audit sample. Fill in the audit sample concentration and the analyst's name on the audit response form included with the audit instructions. Send one copy to the EPA Regional Office or the appropriate enforcement agency and a second copy to the STAC. The EPA Regional Office or the appropriate enforcement agency will report the results of the audit to the laboratory being audited. Include this response with the results of the compliance samples in relevant reports to the EPA Regional Office or the appropriate enforcement agency.

7. Calculations

Same as in Method 17, section 6, with the following additions:

7.1 Nomenclature. Same as in Method 17, section 6.1 with the following additions.

C_{cpm} = Concentration of the CPM in the stack gas, dry basis, corrected to standard conditions, g/dscm (g/dscf).

C_{SO_4} = Concentration of SO_4^{2-} in the sample, mg/ml.

m_w = Sum of the mass of the water and MeCl_2 blanks, mg.

m_n = Mass of the NH_4^+ added to sample to form ammonium sulfate, mg.

m_i = Mass of inorganic CPM matter, mg.

m_o = Mass of organic CPM, mg.

m_d = Mass of dried sample from inorganic fraction, mg.

V_a = Volume of aliquot taken for IC analysis, ml.

V_i = Volume of impinger contents sample, ml.

7.2 Correction for NH_4^+ and H_2O . Calculate the correction factor to subtract the

NH₄⁺ retained in the sample based on the IC SO₄⁻² and if desired, add the combined water removed by the acid-base reaction.

$$m_c = K C_{\text{ind}} V_k \quad \text{Eq. 202-1}$$

where:

K=0.0205, when correcting for NH₄⁺ and H₂O.
=0.1840, when only correcting for NH₄⁺.

7.3 Mass of Inorganic CPM.

$$m_i = m_r \frac{V_k}{V_k - V_b} - m_c \quad \text{Eq. 202-2}$$

7.4 Concentration of CPM.

$$C_{\text{cpm}} = \frac{m_c + m_i - m_b}{VM_{\text{ind}}} \quad \text{Eq. 202-3}$$

8. Alternative Procedures

8.1 Determination of NH₄⁺ Retained in Sample by Titration.

8.1.1 An alternative procedure to determine the amount of NH₄⁺ added to the inorganic fraction by titration may be used. After dissolving the inorganic residue in 100 ml of water, titrate the solution with 0.1 N NH₄OH to a pH of 7.0, as indicated by a pH meter. The 0.1 N NH₄OH is made as follows: Add 7 ml of concentrated (14.8 M) NH₄OH to 1 liter of water. Standardize against standardized 0.1 N H₂SO₄ and calculate the exact normality using a procedure parallel to that described in section 5.5 of Method 6 (appendix A, 40 CFR part 60). Alternatively, purchase 0.1 N NH₄OH that has been standardized against a National Institute of Standards and Technology reference material.

8.1.2 Calculate the concentration of SO₄⁻² in the sample using the following equation.

$$CSO_4 = \frac{48.03}{V.N} \quad \text{Eq. 202-4}$$

100

where

N=Normality of the NH₄OH, mg/ml.

V=Volume of NH₄OH titrant, ml.

48.03=mg/meq.

100=Volume of solution, ml.

8.3.1 Calculate the CPM as described in section 7.

8.2 Analysis of Chlorides by IC. At the conclusion of the final weighing as described in section 5.3.2.3, redissolve the inorganic fraction in 100 ml of water. Analyze an aliquot of the redissolved sample for chlorides by IC using techniques similar to those described in Method 5F for sulfates. Previous

drying of the sample should have removed all HCl. Therefore, the remaining chlorides measured by IC can be assumed to be NH₄Cl, and this weight can be subtracted from the weight determined for CPM.

8.3 Air Purge to Remove SO₂ from Impinger Contents. As an alternative to the post-test N₂ purge described in section 5.2.1, the tester may opt to conduct the post-test purge with air at 20 liter/min. Note: The use of an air purge is not as effective as a N₂ purge.

8.4 Chloroform-ether Extraction. As an alternative to the methylene chloride extraction described in section 5.3.2.1, the tester may opt to conduct a chloroform-ether extraction. Note: The Chloroform-ether was not as effective as the MeCl₂ in removing the organics, but it was found to be an acceptable organic extractant. Chloroform and diethylether of ACS grade, with low blank values (0.001 percent), shall be used. Analysis of the chloroform and diethylether blanks shall be conducted according to Section 5.3.3 for MeCl₂.

8.4.1 Add the contents of Container No. 4 to a 1000-ml separatory funnel. Then add 75 ml of chloroform to the funnel, mix well, and drain off the lower organic phase. Repeat two more times with 75 ml of chloroform. Then perform three extractions with 75 ml of diethylether. This extraction should yield approximately 450 ml of organic extraction. Each time, leave a small amount of the organic/MeCl₂ phase in the separatory funnel ensuring that no water is collected in the organic phase.

8.4.2 Add the contents of Container No. 5 to the organic extraction. Place approximately 300 ml of the organic extract in a tared 350-ml weighing tin while storing the remaining organic extract in a sample container. As the organic extract evaporates, add the remaining extract to the weighing tin.

8.4.3 Determine the weight of the organic phase as described in Section 5.3.2.2.

8.5 Improving Collection Efficiency. If low impinger collection efficiency is suspected, the following procedure may be used.

8.5.1 Place an out-of-stock filter as described in Method 8 between the second and third impingers.

8.5.2 Recover and analyze the filter according to Method 17, Section 4.2. Include the filter holder as part of the connecting glassware and handle as described in sections 5.2.2.2 and 5.2.2.3.

8.5.3 Calculate the Concentration of CPM as follows:

$$C_{\text{cpm}} = \frac{m_c + m_i + m_r - m_b}{VM_{\text{ind}}} \quad \text{Eq. 202-5}$$

where:

m_r = amount of CPM collected on out-of-stock filter, mg.

8.6 Wet Source Testing. When testing at a wet source, use a heated out-of-stock filter as described in Method 5.

9. Bibliography

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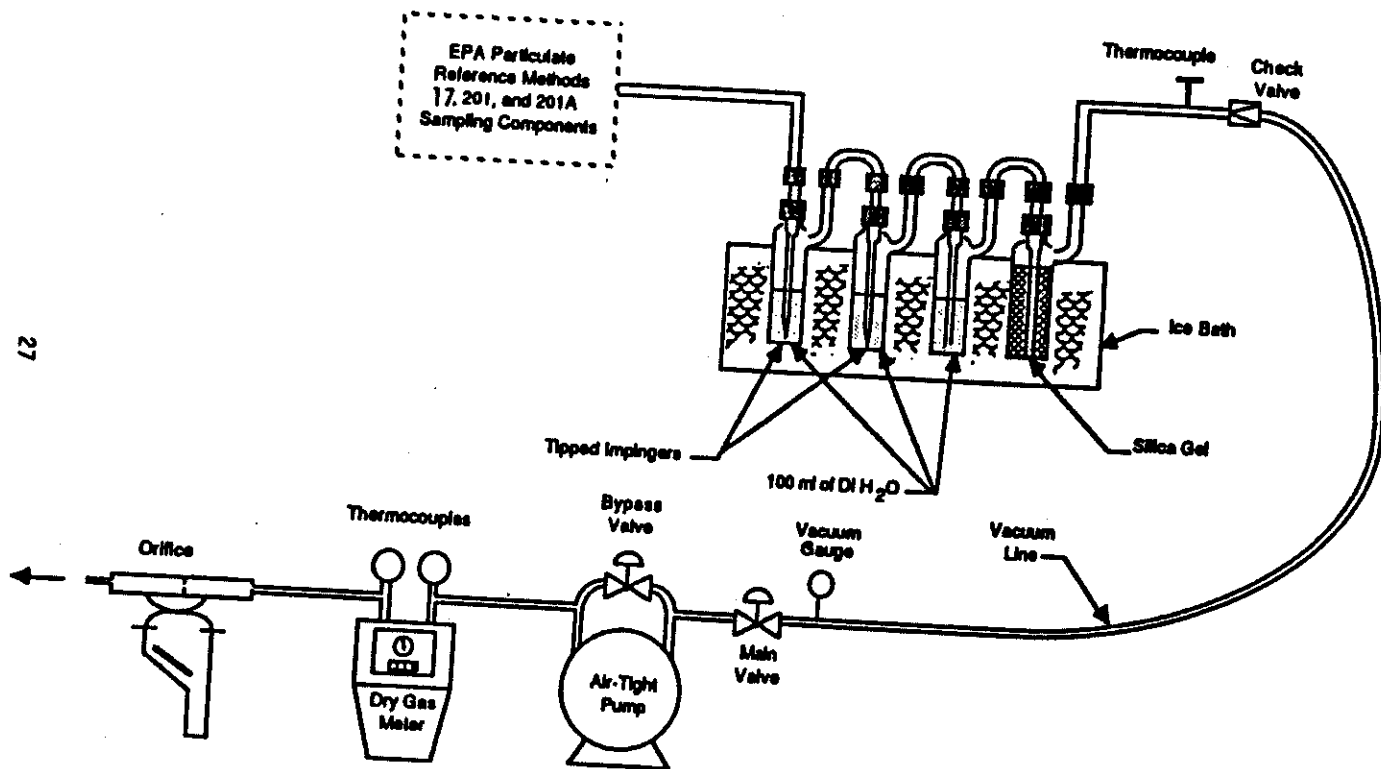


Figure 202-1. Schematic of condensible particulate sampling train.

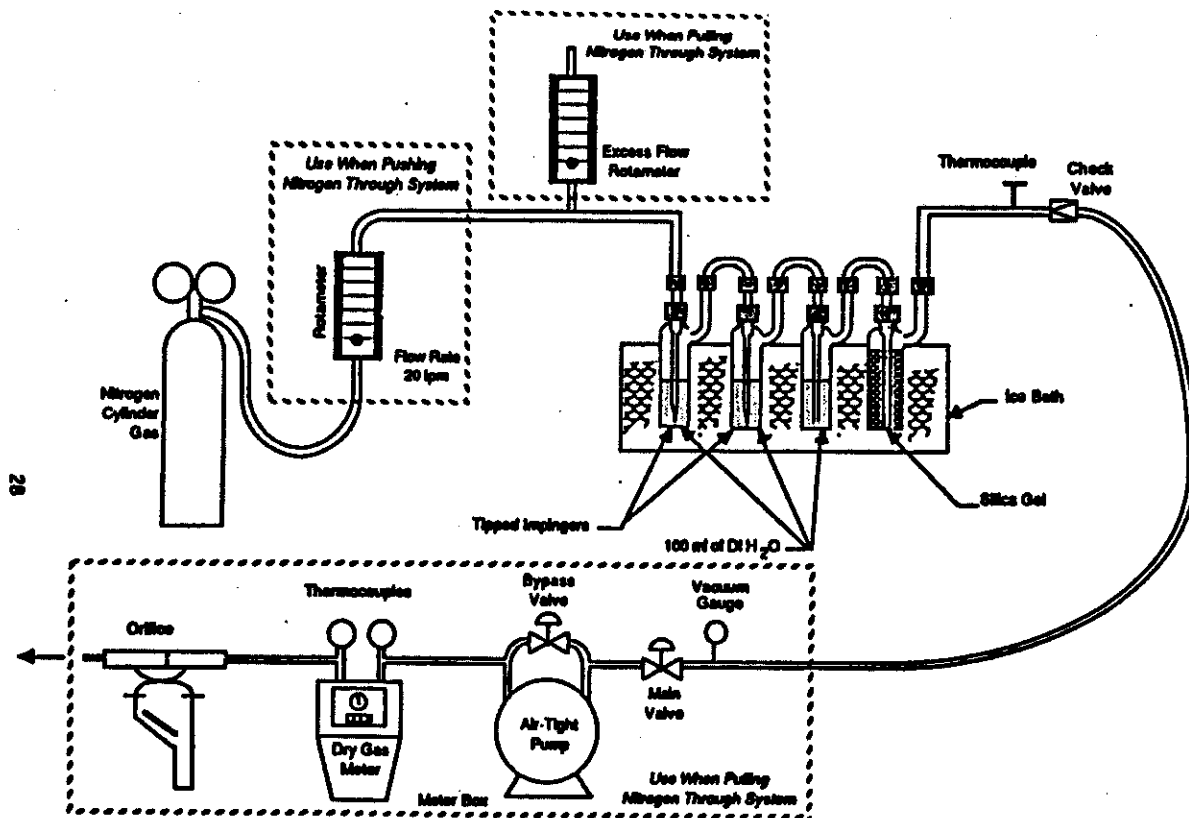


Figure 202-2. Schematic of post-test nitrogen purge system.

Moisture Determination

Volume or weight of liquid in impingers:

_____ ml or g

Weight of moisture in silica gel: _____ g

Sample Preparation (Container No. 4)

Amount of liquid lost during transport:

_____ ml

Final volume: _____ ml

pH of sample prior to analysis: _____

Addition of NH_4OH required: _____Sample extracted 2X with 75 ml MeCl_2 ?: _____**For Titration of Sulfate**Normality of NH_4OH : _____ N

Volume of sample titrated: _____ ml

Volume of titrant: _____ ml

Sample Analysis

Container number	Weight of condensable particulate, mg		
	Final weight	Tare weight	Weight gain
4 (Inorganic)
4 & 5 (Organic)

Total: _____

Less Blank: _____

Weight of Consensible Particulate:

Figure 202-3. Analytical data sheet.

[55 FR 14249, Apr. 17, 1990; 55 FR 24687, June 18, 1990, as amended at 55 FR 37607, Sept. 10, 1990; 56 FR 6276, Feb. 15, 1991; 56 FR 65435, Dec. 17, 1991]

APPENDICES N-O—[RESERVED]**APPENDIX P TO PART 51—MINIMUM EMISSION MONITORING REQUIREMENTS****1.0 PURPOSE.**

This appendix P sets forth the minimum requirements for continuous emission monitoring and recording that each State Implementation Plan must include in order to be approved under the provisions of 40 CFR 51.165(b). These requirements include the source categories to be affected; emission monitoring, recording, and reporting requirements for those sources; performance specifications for accuracy, reliability, and durability of acceptable monitoring systems; and techniques to convert emission data to units of the applicable State emission standard. Such data must be reported to the State as an indication of whether proper maintenance and operating procedures are being utilized by source operators to maintain emission levels at or below emission standards. Such data may be used directly or indirectly for compliance determination or any other purpose deemed appropriate by the State. Though the monitoring requirements

are specified in detail, States are given some flexibility to resolve difficulties that may arise during the implementation of these regulations.

1.1 APPLICABILITY

The State plan shall require the owner or operator of an emission source in a category listed in this appendix to: (1) Install, calibrate, operate, and maintain all monitoring equipment necessary for continuously monitoring the pollutants specified in this appendix for the applicable source category; and (2) complete the installation and performance tests of such equipment and begin monitoring and recording within 18 months of plan approval or promulgation. The source categories and the respective monitoring requirements are listed below.

1.1.1 Fossil fuel-fired steam generators, as specified in paragraph 2.1 of this appendix, shall be monitored for opacity, nitrogen oxides emissions, sulfur dioxide emissions, and oxygen or carbon dioxide.

1.1.2 Fluid bed catalytic cracking unit catalyst regenerators, as specified in paragraph 2.4 of this appendix, shall be monitored for opacity.

1.1.3 Sulfuric acid plants, as specified in paragraph 2.3 of this appendix, shall be monitored for sulfur dioxide emissions.

1.1.4 Nitric acid plants, as specified in paragraph 2.2 of this appendix, shall be monitored for nitrogen oxides emissions.

1.2 EXEMPTIONS

The States may include provisions within their regulations to grant exemptions from the monitoring requirements of paragraph 1.1 of this appendix for any source which is:

1.2.1 Subject to a new source performance standard promulgated in 40 CFR part 60 pursuant to section 111 of the Clean Air Act; or

1.2.2 not subject to an applicable emission standard of an approved plan; or

1.2.3 scheduled for retirement within 5 years after inclusion of monitoring requirements for the source in appendix P, provided that adequate evidence and guarantees are provided that clearly show that the source will cease operations prior to such date.

1.3 EXTENSIONS

States may allow reasonable extensions of the time provided for installation of monitors for facilities unable to meet the prescribed timeframe (i.e., 18 months from plan approval or promulgation) provided the owner or operator of such facility demonstrates that good faith efforts have been made to obtain and install such devices within such prescribed timeframe.

1.4 MONITORING SYSTEM MALFUNCTION

The State plan may provide a temporary exemption from the monitoring and report-

ing requirements of this appendix during any period of monitoring system malfunction, provided that the source owner or operator shows, to the satisfaction of the State, that the malfunction was unavoidable and is being repaired as expeditiously as practicable.

2.0 MINIMUM MONITORING REQUIREMENT

States must, as a minimum, require the sources listed in paragraph 1.1 of this appendix to meet the following basic requirements.

2.1 FOSSIL FUEL-FIRED STEAM GENERATORS

Each fossil fuel-fired steam generator, except as provided in the following subparagraphs, with an annual average capacity factor of greater than 30 percent, as reported to the Federal Power Commission for calendar year 1974, or as otherwise demonstrated to the State by the owner or operator, shall conform with the following monitoring requirements when such facility is subject to an emission standard of an applicable plan for the pollutant in question.

2.1.1 A continuous monitoring system for the measurement of opacity which meets the performance specifications of paragraph 3.1.1 of this appendix shall be installed, calibrated, maintained, and operated in accordance with the procedures of this appendix by the owner or operator of any such steam generator of greater than 250 million BTU per hour heat input except where:

2.1.1.1 gaseous fuel is the only fuel burned, or

2.1.1.2 oil or a mixture of gas and oil are the only fuels burned and the source is able to comply with the applicable particulate matter and opacity regulations without utilization of particulate matter collection equipment, and where the source has never been found, through any administrative or judicial proceedings, to be in violation of any visible emission standard of the applicable plan.

2.1.2 A continuous monitoring system for the measurement of sulfur dioxide which meets the performance specifications of paragraph 3.1.3 of this appendix shall be installed, calibrated, maintained, and operated on any fossil fuel-fired steam generator of greater than 250 million BTU per hour heat input which has installed sulfur dioxide pollutant control equipment.

2.1.3 A continuous monitoring system for the measurement of nitrogen oxides which meets the performance specification of paragraph 3.1.2 of this appendix shall be installed, calibrated, maintained, and operated on fossil fuel-fired steam generators of greater than 1000 million BTU per hour heat input when such facility is located in an Air Quality Control Region where the Administrator has specifically determined that a control

strategy for nitrogen dioxide is necessary to attain the national standards, unless the source owner or operator demonstrates during source compliance tests as required by the State that such a source emits nitrogen oxides at levels 30 percent or more below the emission standard within the applicable plan.

2.1.4 A continuous monitoring system for the measurement of the percent oxygen or carbon dioxide which meets the performance specifications of paragraphs 3.1.4 or 3.1.5 of this appendix shall be installed, calibrated, operated, and maintained on fossil fuel-fired steam generators where measurements of oxygen or carbon dioxide in the flue gas are required to convert either sulfur dioxide or nitrogen oxides continuous emission monitoring data, or both, to units of the emission standard within the applicable plan.

2.2 NITRIC ACID PLANTS

Each nitric acid plant of greater than 300 tons per day production capacity, the production capacity being expressed as 100 percent acid, located in an Air Quality Control Region where the Administrator has specifically determined that a control strategy for nitrogen dioxide is necessary to attain the national standard shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of nitrogen oxides which meets the performance specifications of paragraph 3.1.2 for each nitric acid producing facility within such plant.

2.3 SULFURIC ACID PLANTS

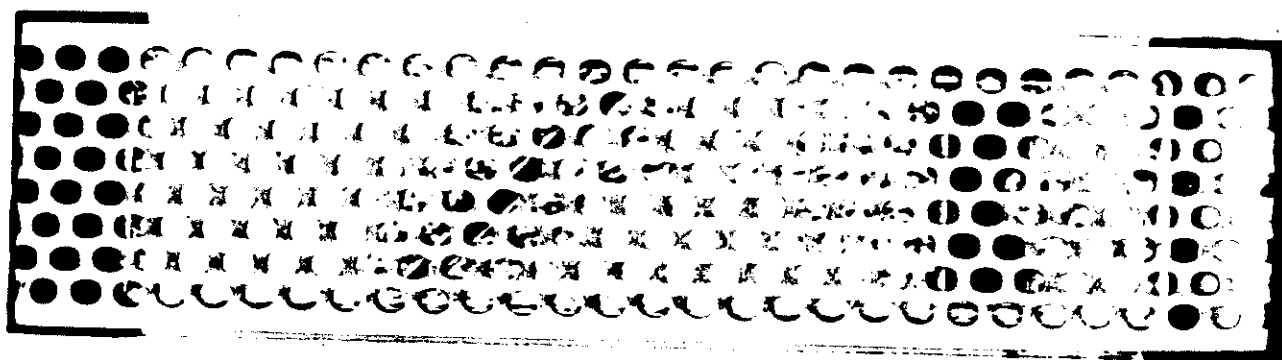
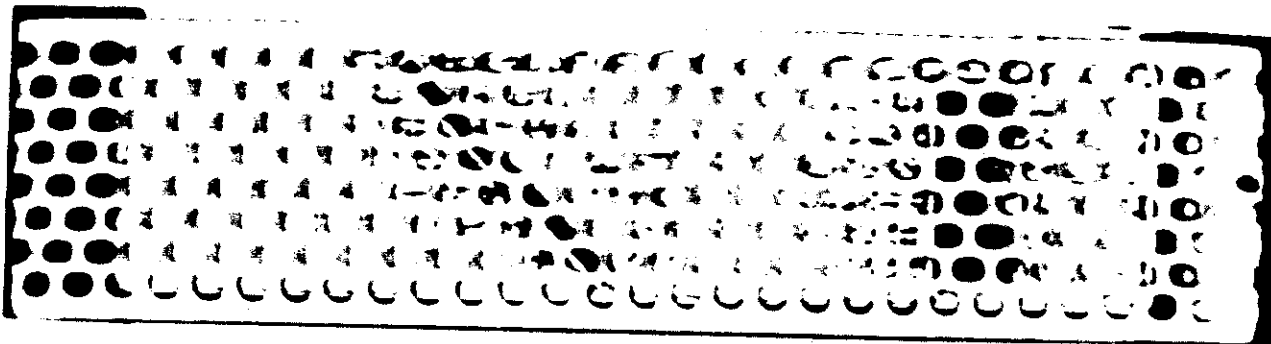
Each Sulfuric acid plant of greater than 300 tons per day production capacity, the production being expressed as 100 percent acid, shall install, calibrate, maintain and operate a continuous monitoring system for the measurement of sulfur dioxide which meets the performance specifications of paragraph 3.1.3 for each sulfuric acid producing facility within such plant.

2.4 FLUID BED CATALYTIC CRACKING UNIT CATALYST REGENERATORS AT PETROLEUM REFINERIES

Each catalyst regenerator for fluid bed catalytic cracking units of greater than 20,000 barrels per day fresh feed capacity shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of opacity which meets the performance specifications of paragraph 3.1.1.

3.0 MINIMUM SPECIFICATIONS

All State plans shall require owners or operators of monitoring equipment installed to comply with this appendix, except as provided in paragraph 3.2, to demonstrate compliance with the following performance specifications.



identifying the key studies that will shape the determination of a standard. Intensive evaluation of such studies by CASAC and the public will considerably increase your ability to set a scientifically supportable standard.

The Committee is greatly encouraged by your decision to improve the format and content of OAQPS scientific issue staff papers. In the Draft Staff Paper for Particulate Matter key studies are identified and their implications for setting primary and secondary standards are discussed. More importantly, the inclusion of numerical ranges and their supporting rationale enable the Committee and the public to critically examine the staff's proposed use of the studies. This led to a marked improvement in the quality of the public dialogue concerning the scientific basis for revising the standard. CASAC commends your effort and recommends that all staff papers developed for ambient air standards contain numerical ranges.

CASAC recognizes that your statutory responsibility to set standards requires public health policy judgments in addition to determination of a strictly scientific nature. While the Committee is willing to further advise you on the particulate standard, we see no need, in view of the already extensive comments provided, to review the proposed particulate standards prior to their publication in the Federal Register. In this instance, the public comment period will provide sufficient opportunity for the Committee to provide any additional comment or review that may be necessary.

December 16, 1986.

The Honorable Lee Thomas,
Administrator, U.S. Environmental Protection
Agency, Washington, DC 20460.

Dear Mr. Thomas: The Clean Air Scientific Advisory Committee (CASAC) has completed its review of the 1986 Addendum to the 1982 Staff Paper on Particulate Matter (*Review of the NAAQS for Particulate Matter: Assessment of Scientific and Technical Information*) prepared by the Agency's Office of Air Quality Planning and Standards (OAQPS).

The Committee unanimously concludes that this document is consistent in all significant respects with the scientific evidence presented and interpreted in the combined Air Quality Criteria Document for Particulate Matter/Sulfur Oxides and its 1986 Addendum, on which the CASAC recently issued its closure letter. The Committee believes that this document provides you with the kind and amount of technical guidance that will be needed to make appropriate revisions to the standards. The Committee's major findings and conclusions concerning the various scientific issues and studies discussed in the Staff Paper

Addendum are contained in the attached report.

Thank you for the opportunity to present the Committee's views on this important public health issue.

Sincerely,

Morton Lippmann, Ph.D.,

Chairman, Clean Air Scientific Advisory Committee.

cc: A. James Barnes, Gerald Emison, Vaun Newill, John O'Connor, Craig Potter, Terry Yocis.

Summary of Major Scientific Issues and CASAC Conclusions on the 1986 Draft Addendum to the 1982 Particulate Matter Staff Paper

The Committee found the technical discussions contained in the Staff Paper Addendum to be acceptable with minor revisions.

Particle Size Indicator

The CASAC reaffirms its January 29, 1982 recommendation that a particle size indicator that includes only those particles less than or equal to a nominal 10 μm aerodynamic diameter, termed PM_{10} , is appropriate for regulation of particulate concentrations. This judgment is based on analysis of the earlier available data, and the analysis of the recent scientific studies discussed in the 1986 Addendum to the Air Quality Criteria for Particulate Matter/Sulfur Oxides and the 1986 Addendum to the Particulate Matter Staff Paper.

Implications of London Mortality Studies

Further analyses of the London mortality studies, including recent analysis by Agency staff, suggest that:

- (1) the data provide no evidence for a threshold for the association between airborne particles and daily mortality or a change of coefficient with changes in particle composition;
- (2) mortality effects can be associated with PM alone (with or without sulfur oxides);
- (3) there is no reliable quantitative basis for converting British Smoke (BS) readings to PM_{10} gravimetric mass at low ($<100\text{--}200\ \mu\text{g}/\text{m}^3$) BS levels, and hence the mortality data are not readily useful for establishing a lower bound for 24-hour PM_{10} NAAQS, although the suggestion of mortality at relatively low PM levels must be given serious consideration in selecting a margin of safety.

Interpretation of Lung Function Studies for 24-hour Standard

Although the lung function decrements observed in children during and after air pollution episodes are of uncertain health significance, the two

episodic lung function studies (Dockery et al., 1986; Dassen et al., 1986) are consistent with each other and the earlier work of Stebbings. They provide a relatively sensitive indication of possible short term physiological responses. Given the difficulty in deriving a lower limit from the mortality studies, these lung function studies can be useful in determining lower bounds for a 24-hour PM_{10} standard.

Interpretation of the Six Cities Study for Annual Standard

In general, the Committee felt that the six cities data are useful in establishing the lower bound of the range for the annual standard. In addition, the following are suggested by the data:

- (1) Cough and bronchitis, as defined in this study, are about twice as prevalent in children living in cities with PM_{10} in the range of $40\text{--}60\ \mu\text{g}/\text{m}^3$ in comparison to cities with $20\text{--}30\ \mu\text{g}/\text{m}^3$;
- (2) Because factors other than particulate matter may affect the inter-city differences, it is difficult to determine whether these associations should be designated as "likely" health effects;
- (3) The results are consistent with the Ostro studies in terms of morbidity responses at long-term average particulate matter exposures within current particulate ambient air quality standards; and
- (4) The results are consistent with the Bouhuys study in terms of symptoms without changes in pulmonary function.

Ranges for 24-hour and Annual Standards for PM_{10}

In its January 2, 1986 letter to the Administrator, the CASAC noted that its preliminary analyses of the more recent data do not indicate the need for fundamental changes in the structure of the proposed particle standards; however, the Committee pointed out that these new data suggest the need to focus consideration on standards at or perhaps below the low ends of the ranges proposed in the March 20, 1984 Federal Register Notice. The ranges of interest then proposed were $150\text{--}250\ \mu\text{g}/\text{m}^3$ for 24-hour standard, and $50\text{--}65\ \mu\text{g}/\text{m}^3$ for annual standard.

Since then, EPA staff have proposed updated ranges of interest for both the 24-hour standard ($140\text{--}250\ \mu\text{g}/\text{m}^3$), and the annual standard ($40\text{--}65\ \mu\text{g}/\text{m}^3$), based on short-term and long-term epidemiological data, respectively. The Committee finds these ranges of interest reasonable, given the scientific data and related uncertainties; however, a final decision should also weigh evidence from clinical and toxicological studies

§ 50.2

[36 FR 22384, Nov. 25, 1971, as amended at 41 FR 11253, Mar. 17, 1976; 48 FR 2529, Jan. 20, 1983]

§ 50.2 Scope.

(a) National primary and secondary ambient air quality standards under section 109 of the Act are set forth in this part.

(b) National primary ambient air quality standards define levels of air quality which the Administrator judges are necessary, with an adequate margin of safety, to protect the public health. National secondary ambient air quality standards define levels of air quality which the Administrator judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Such standards are subject to revision, and additional primary and secondary standards may be promulgated as the Administrator deems necessary to protect the public health and welfare.

(c) The promulgation of national primary and secondary ambient air quality standards shall not be considered in any manner to allow significant deterioration of existing air quality in any portion of any State.

(d) The proposal, promulgation, or revision of national primary and secondary ambient air quality standards shall not prohibit any State from establishing ambient air quality standards for that State or any portion thereof which are more stringent than the national standards.

§ 50.3 Reference conditions.

All measurements of air quality are corrected to a reference temperature of 25° C. and to a reference pressure of 760 millimeters of mercury (1,013.2 millibars).

§ 50.4 National primary ambient air quality standards for sulfur oxides (sulfur dioxide).

The national primary ambient air quality standards for sulfur oxides measured as sulfur dioxide by the reference method described in appendix A to this part, or by an equivalent method, are:

(a) 80 micrograms per cubic meter (0.03 p.p.m.)—annual arithmetic mean.

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(b) 365 micrograms per cubic meter (0.14 p.p.m.)—Maximum 24-hour concentration not to be exceeded more than once per year.

§ 50.5 National secondary ambient air quality standards for sulfur oxides (sulfur dioxide).

The national secondary ambient air quality standard for sulfur oxide measured as sulfur dioxide by the reference method described in appendix A to this part, or by any equivalent method is 1,300 micrograms per cubic meter (0.5 p.p.m.) maximum 3-hour concentration not to be exceeded more than once per year.

[38 FR 25081, Sept. 14, 1973]

§ 50.6 National primary and secondary ambient air quality standards for particulate matter.

(a) The level of the national primary and secondary 24-hour ambient air quality standards for particulate matter is 150 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), 24-hour average concentration. The standards are attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu\text{g}/\text{m}^3$, as determined in accordance with appendix K to this part, is equal to or less than one.

(b) The level of the national primary and secondary annual standards for particulate matter is 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), annual arithmetic mean. The standards are attained when the expected annual arithmetic mean concentration, as determined in accordance with appendix K to this part, is less than or equal to 50 $\mu\text{g}/\text{m}^3$.

(c) For the purpose of determining attainment of the primary and secondary standards, particulate matter shall be measured in the ambient air as PM₁₀ (particles with an aerodynamic diameter less than or equal to a nominal 10 micrometers) by:

(1) A reference method based on appendix J and designated in accordance with part 53 of this chapter, or

(2) An equivalent method designated in accordance with part 53 of this chapter.

[52 FR 24663, July 1, 1987]

Environmental Protection

§ 50.7 [Reserved]

**§ 50.8 National primary
quality standards for
oxide.**

(a) The national prime quality standards for ca are:

(1) 9 parts per million per cubic meter) for any concentration not to be than once per year and

(2) 35 parts per million per cubic meter) for a concentration not to be than once per year.

(b) The levels of carbon dioxide in the ambient air shall be

(1) A reference method
pendix C and designated
with part 53 of this chart

(2) An equivalent method in accordance with part 1, ter.

(c) An 8-hour average is considered valid if at least 75 percent of the hourly averages for the day are available. In the event six (or seven) hourly averages are available, the 8-hour average is computed on the basis of the available averages using six (or seven) averages.

(d) When summarizing comparison with the standards, the stages shall be stated to the place. Comparison of the levels of the standards in the comparison shall be made in terms with fractional parts of rounding up.

[50 FR 37501, Sept. 13, 1985]

§ 50.9 National primary ambient air quality ozone.

(a) The level of the national and secondary ambient standards for ozone measured by the reference method based on this part and designated with part 53 of this chapter per million ($235 \mu\text{g}/\text{m}^3$). The standard is attained when the expected number of days per calendar year with hourly average concentrations of 0.12 part per million ($235 \mu\text{g}/\text{m}^3$) or less than 1, as determined in appendix H.

§ 60.142a

trol system, such as from lance hole openings, gaps or tears in the ductwork of the primary emission control system, or leaks in hoods.

Skimming station means the facility where slag is mechanically raked from the top of the bath of molten iron.

Steel production cycle means the operations conducted within the BOPF steelmaking facility that are required to produce each batch of steel, including the following operations: scrap charging, preheating (when used), hot metal charging, primary oxygen blowing, sampling (vessel turndown and turnup), additional oxygen blowing (when used), tapping, and deslagging. Hot metal transfer and skimming operations for the next steel production cycle are also included when the hot metal transfer station or skimming station is an affected facility.

Top-blown furnace means any BOPF in which oxygen is introduced to the bath of molten iron by means of an oxygen lance inserted from the top of the vessel.

§ 60.142a Standards for particulate matter.

(a) Except as provided under paragraphs (b) and (c) of this section, on and after the date on which the performance test under § 60.8 is required to be completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any secondary emissions that:

(1) Exit from the BOPF shop roof monitor (or other building openings) and exhibit greater than 10 percent opacity during the steel production cycle of any top-blown BOPF or during hot metal transfer or skimming operations for any bottom-blown BOPF; except that an opacity greater than 10 percent but less than 20 percent may occur once per steel production cycle.

(2) Exit from a control device used solely for the collection of secondary emissions from a top-blown BOPF or from hot metal transfer or skimming for a top-blown or a bottom-blown BOPF and contain particulate matter in excess of 23 mg/dscm (0.010 gr/dscf).

(3) Exit from a control device used solely for the collection of secondary emissions from a top-blown BOPF or

40 CFR Ch. I (7-1-94 Edition)

from hot metal transfer or skimming for a top-blown or a bottom-blown BOPF and exhibit more than 5 percent opacity.

(b) A fume suppression system used to control secondary emissions from an affected facility is not subject to paragraphs (a)(2) and (a)(3) of this section.

(c) A control device used to collect both primary and secondary emissions from a BOPF is not subject to paragraphs (a)(2) and (a)(3) of this section.

§ 60.143a Monitoring of operations.

(a) Each owner or operator of an affected facility shall install, calibrate, operate, and maintain a monitoring device that continually measures and records for each steel production cycle the various rates or levels of exhaust ventilation at each phase of the cycle through each duct of the secondary emission capture system. The monitoring device or devices are to be placed at locations near each capture point of the secondary emission capture system to monitor the exhaust ventilation rates or levels adequately, or in alternative locations approved in advance by the Administrator.

(b) If a chart recorder is used, the owner or operator shall use chart recorders that are operated at a minimum chart speed of 3.8 cm/hr (1.5 in/hr).

(c) All monitoring devices are to be certified by the manufacturer to be accurate to within ± 10 percent compared to EPA Reference Method 2. The owner or operator shall recalibrate and check the device(s) annually and at other times as the Administrator may require, in accordance with the written instructions of the manufacturer and by comparing the device against EPA Reference Method 2.

(d) Each owner or operator subject to the requirements of paragraph (a) of this section shall report on a semi-annual basis all measurements of exhaust ventilation rates or levels over any 3-hour period that average more than 10 percent below the average rates or levels of exhaust ventilation maintained during the most recent performance test conducted under § 60.8 in which the affected facility demonstrated compliance with the standard under § 60.142a(a)(2). The accuracy

Environmental Protection Agency

of the respective measurements, exceed the values specified in graph (c) of this section, may be considered when determining the measurement results that must be reported.

(e) If a scrubber primary emission control device is used to collect secondary emissions, the owner or operator shall report on a semiannual all measurements of exhaust ventilation rate over any 3-hour period average more than 10 percent below average levels maintained during most recent performance test conducted under § 60.8 in which the affected facility demonstrated compliance with the standard under § 60.142(a)(1).

§ 60.144a Test methods and procedures.

(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b).

(b) The owner or operator shall determine compliance with the particulate matter standards in § 60.142a as follows:

(1) Start and end times of each steel production cycle during each run shall be recorded (see § 60.145a (c) and (d) for the definitions of start and end times of a cycle).

(2) Method 5 shall be used to determine the particulate matter concentration. Sampling shall be conducted during the steel production cycle for a sufficient number of steel production cycles to obtain a total sample volume of at least 5.67 dscm (200 cfm) for each run.

(3) Method 9 and the procedures in § 60.11 shall be used to determine opacity, except sections 2.4 and 2.5 of Method 9 shall be replaced with the following instructions for recording observations and reducing data:

(i) Section 2.4. Opacity observations shall be recorded to the nearest 5 percent at 15-second intervals. During initial performance test conducted pursuant to § 60.8, observations shall be made and recorded in this manner for a minimum of three steel production cycles. During any subsequent compliance test, observations may be made

